

IBM expands arsenal for client/server

By Wayne Eckerson
Senior Editor

HURSLEY, U.K. — IBM this week will announce new products that give the embattled computer maker a much-needed boost in the client/server market and make it easier to build distributed applications that work across IBM and non-IBM platforms.

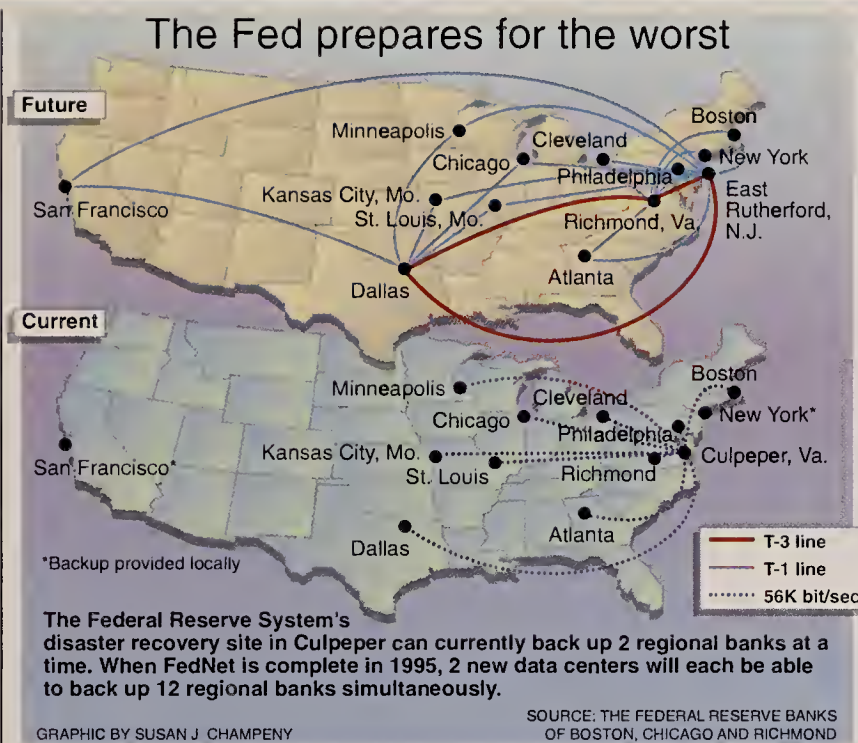
IBM's Networking Systems Group, based here, is expected to roll out a client/server version of

IBM to add router features to its 8250 hub, page 5.

its CICS for OS/2 on-line transaction processing (OLTP) system that will help users downsize mainframe-based transaction processing applications to local-area network environments.

In addition, IBM and Systems Strategies, Inc. of New York will unveil a series of asynchronous messaging products based on the Message Queue Interface (MQI) IBM announced last fall.

"The new MQI software represents a significant step for IBM because it goes a long way toward" (continued on page 8)



Federal Reserve moves to disaster-proof its network

By Jim Duffy
Senior Editor

CULPEPER, Va. — A bombing at the World Trade Center. A catastrophic storm stretching from Florida to Maine.

Disasters such as these can disrupt any organization, but if they knock out the Federal Reserve System's network, they could cripple the nation's ability to do business.

The Fed is the circulatory sys-

tem of the nation's economy, handling more than a trillion dollars worth of electronic transactions each day. To ensure that it can withstand virtually any disaster, the Fed is revamping its disaster recovery plan as part of a larger net upgrade that addresses everything from network switching and transmission to funds transfer and data processing.

The overhaul of the Fed's di- (continued on page 62)

Novell to go native with TCP/IP support

Reveals details about product that will let users support NetWare on TCP/IP without using IPX.

By Caryn Gillooly
Senior Editor

SALT LAKE CITY — Novell, Inc. last week revealed details of a long-awaited product that will enable customers to run NetWare over TCP/IP without using the company's proprietary Internetwork Packet Exchange (IPX) protocol.

NetWare/IP, discussed at the company's BrainShare '93 developers' conference here, will help

Novell fills in details of Mac integration plans, page 8.

users scale up their networks without having to contend with the performance limitations of IPX and the headaches associated with using multiple protocols.

Although NetWare/IP technically eliminates the need to run IPX at all — even over local links between clients and servers — Novell said its goal is not to supplant the protocol.

The company envisions NetWare/IP being used primarily for wide-area connections and as-

sumes a majority of customers will retain IPX for their NetWare local-area networks. NetWare/IP will simply give customers a choice of running core NetWare (continued on page 10)

INSIDE



IBM's LAN inter-net strategy matures to offer users a range of interconnection options. Page 42.

Security Test Series finds NetWare SFT III sets the standard for fault tolerance in NOSes. Page 48.



AT&T eases up a bit on Fresh Look

By Ellen Messmer
Senior Correspondent

WASHINGTON, D.C. — It wasn't good news, but it could have been worse.

In an FCC filing, AT&T last week presented its "Fresh Look" pricing plan under which users that drop Tariff 12 plans to take advantage of 800 portability will pay an average of 20% more for AT&T services while they make the transition to another carrier.

The Custom Network Services Group, an association of Tariff 12 users, grudgingly accepted the AT&T proposal, calling it better than the much higher price increases — up to 70% — that AT&T had earlier indicated would be imposed.

Fresh Look refers to the Federal Communications Commission-mandated period from May 1 to (continued on page 61)

Computer makers race to claim future server market

By Bob Brown
Senior Editor

As users expand beyond simple client/server systems, desktop vendors and "big iron" suppliers are racing to retool their hardware and deliver server platforms that will support emerging distributed business applications.

While these suppliers are attacking the next-generation server market from different ends of the hardware spectrum, their offerings will look remarkably similar. The new servers will harness the power of multiple microprocessors and offer redundancy and management features needed to anchor core business systems that cannot be supported by file-and-print servers and are too

costly to deploy on hosts.

Buoyed by the emergence of Intel Corp.'s Pentium microprocessor, which began shipping last week, vendors of Intel-based servers plan to go upscale (see "Server, software vendors plot their Pentium plans," page 64).

Big systems vendors such as IBM, NCR Corp. and Digital Equipment Corp. see a new window of opportunity in this advanced server market and are hoping their expertise in host-based applications and management, combined with new hardware offerings, will help them retain their customer bases.

"Focusing on servers is the big systems vendors' only vehicle for" (continued on page 64)

NETLINE



RETIX TO ENHANCE its router's SNA support and unveil ATM interface. Page 5.

SUNSOFT TO SHIP Solaris 2.0 for Intel x86-based systems. Page 5.

LOTUS TAKES WRAPS OFF long-awaited Notes upgrade. Page 6.

AT&T PBX-BASED videocon-

ferencing system lets users share video and PC files from the desktop. Page 6.

SYNOPTICS TO ADD hub mgmt. software to Novell's NetWare Management System. Page 6.

START-UP Modular Computing Technologies to unveil superservers based on Intel Pentium chip. Page 62.

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Retix to improve support for SNA, offer ATM interface

Enhanced support for SNA builds on SRB software; router interface to put vendor at ATM forefront.

By Maureen Molloy
Senior Editor

SANTA MONICA, Calif. — Retix will roll out over the next year several features that will enable its RouterXchange 7000 router to better support IBM Systems Network Architecture traffic.

The vendor will also unveil a native Asynchronous Transfer Mode (ATM) interface that will enable its router to forge high-speed links to ATM-based workstations as well as private wide-area backbones. Retix will be six months ahead of most of its competitors if it delivers the interface this summer, as promised.

Retix's enhanced IBM support will build on top of its existing source route bridging (SRB) software, which enables the router to carry token-ring IBM Network Basic I/O System traffic across an internet.

The router also supports the source routing transparent bridging algorithm, which lets users bridge traffic between Ethernet and token-ring local-area networks.

Retix will boost its SNA support by the end of the year when it equips its router with a Synchronous Data Link Control-to-802.2

(continued on page 6)

IBM to add 6611 routing features to its 8250 hub

Will add Data Link Switching, conversion modules.

By Michael Cooney
and Skip MacAskill
Network World Staff

LA GAUDE, France — In an effort to stake a larger claim in the fledgling SNA/LAN interconnectivity market, IBM will soon add routing and additional bridging support to its 8250 intelligent hub family.

IBM confirmed it will add features of its 6611 router to the 8250 this fall in order to let users simplify their networks by combining the functions of a router, bridge and local-area network hub in one box.

According to analysts familiar

with IBM's plans, IBM will add Data Link Switching (DLS) and Synchronous Data Link Control-to-Logical Link Control 2 (LLC2) conversion modules to the 8250.

DLS is IBM's technology for routing Systems Network Architecture and Network Basic I/O System traffic over Transmission Control Protocol/Internet Protocol nets. SDLC-to-LLC2 conversion would let users attach cluster controllers and other SDLC devices to the hub and ship traffic from those devices over the LAN and multiprotocol internet to a remote host.

(continued on page 12)

SunSoft to offer version of Solaris for PC platform

By Fredric Paul
Senior Editor

MOUNTAIN VIEW, Calif. — SunSoft, Inc., a business unit of Sun Microsystems, Inc., this week is scheduled to announce availability and pricing of its Solaris 2.0 Unix-based distributed operating system for Intel Corp. platforms.

Solaris x86, which is now available only for Sun's scalable processor architecture (SPARC) workstations today, offers users the chance to deploy the high-powered, network-ready operating system on less expensive platforms and represents another

competitor in the emerging 32-bit operating system camp.

Solaris x86 will compete with the likes of IBM's OS/2, Microsoft Corp.'s upcoming Windows NT, NeXT, Inc.'s version of Unix and a product from Taligent, the joint venture between Apple Computer, Inc. and IBM.

The most direct competitor for Solaris x86, however, will probably be UnixWare — a product offered by Univel, a company Novell, Inc. is trying to acquire. But Solaris and UnixWare may not go head-to-head right away.

"UnixWare buyers tend to be

(continued on page 9)

Briefs

EDS gets ATMs back on line. Electronic Data Systems Corp. (EDS) late last week restored all but about 400 of the 5,000 automatic teller machines knocked off-line when a major snowstorm blanketed the East Coast two weeks ago. EDS operates 12 ATM networks out of a Clifton, N.J., data center that was disabled when an accumulation of snow and ice collapsed the building's roof. EDS arranged to have other ATM network providers serve customers that were inconvenienced by the outage, and an estimated \$50 million was withdrawn from banks on the alternate ATM networks, according to industry reports. EDS will reimburse those banks, a company spokesman said.

DEC plots Unix plans. Digital Equipment Corp., a conspicuous absentee from the group of six firms looking to deliver a unified Unix, is studying the group's objectives and has not ruled out participation, Robert Palmer, DEC president and chief executive officer, said last week. But Palmer also noted that DEC is already shipping DEC OSF/1, which accomplishes most of what the group is setting out to do. Observers doubt that DEC will join the group, noting that the company is a staunch supporter of Microsoft Corp.'s Windows NT operating system, a product whose influence and momentum the group is out to thwart.

IBM's DLS gets IETF approval. IBM last week announced that the Internet Engineering Task Force (IETF) has made Big Blue's Data Link Switching (DLS) technology an informational request for comment (RFC). Now known as RFC 1434, the DLS technology is now free of charge for any vendor to implement in their routers, hubs or other networking products. DLS is IBM's technique for transporting Systems Network Architecture and Network Basic I/O System data over Transmission Control Protocol/Internet Protocol nets.

Kerry pushes library bill. Sen. Bob Kerry (D-Neb.) last week introduced The Electronic Library Act of 1993 (S. 626), which would fund the creation of digital libraries for state colleges and universities. To qualify to receive any of the \$35 million in funding, states would have to set up a committee with representatives from the areas of education, telecommunications, government and business to develop a plan for accessing the library information over a net.

SprintNet gets faster, goes farther. Sprint Corp. is expected to announce this week that its SprintNet international value-added network will support dial-up access at 9.6K bit/sec from any point by year end. The company will also announce support for dedicated access at speeds greater than 56K bit/sec and will detail expansion of the net to an unspecified number of new countries. Sprint declined comment on the announcement.

AT&T lands contracts. AT&T last week announced that it has signed a series of custom network agreements exceeding \$200 million with Ford Motor Co., Amoco Corp., Air Products and Chemicals, Inc. and Policy Management Systems Corp. Ford awarded AT&T a three-year extension on an existing Virtual Telecommunications Network Service (VTNS) agreement, while Amoco signed a three-year VTNS contract that includes domestic and international services. The custom net for Air Products of Allentown, Pa., will link more than 280 of the firm's locations worldwide. Policy Management of Columbia, S.C., signed a five-year contract for voice, data, international and video communications services.

CONTENTS

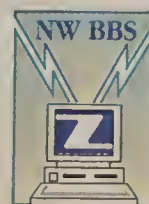
Data Net Architectures	15
McData 7100s get software update pack.	
HP, IBM to buttress and speed DME development.	
Local Networking	17
NetWare break-in offers security lesson.	
Sun ups Windows support on new version of PC-NFS.	
Internetworks	21
Navy sails LAN seas with air-blown fiber.	
BT teams up with HP, Sun for LAN/WAN management.	
Global Services	25
AT&T rolls out new transaction service.	
Bell Atlantic set to widen SMDS availability in region.	
Enterprise Applications	27
EcoSystems bolsters client/server tools.	
Vendors to fuse imaging, work flow technologies.	
Industry Update	33
Net mgmt. challenges call for cooperation.	
Documents show NCR may lose rights to IBM's NCP.	
Management Strategies	39
Job picture brightens for net professionals.	
Firms offer recovery tips following WTC bombing.	
Opinions	40
Features	42
Action Center	52
Networking Marketplace	59
Networking Careers	61

CONTACTS



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Notes 3.0 finally makes debut amid much fanfare

Windows 3.1 server opens it to small work groups.

By Cara Cunningham
and Wayne Eckerson
Special to Network World

NEW YORK — In a day-long event attended by nearly 1,000 people and featuring a mini trade show with 60 exhibitors, Lotus Development Corp.'s top brass unveiled the long-awaited upgrade to the company's Notes work group computing software.

Notes 3.0, which was announced simultaneously here and at CeBIT '93 in Hannover, Germany, features an Apple Computer, Inc. Macintosh client as well as Notes servers for Micro-

soft Corp. Windows NT, Novell, Inc. NetWare and four versions of Unix, said Jim Manzi, president and chief executive officer of the Cambridge, Mass.-based firm.

The new release of Notes, which previously ran on OS/2 servers as well as Windows and OS/2 clients, will also feature, as expected, a Windows 3.1 server, opening the environment to small work groups, Manzi said ("Notes drills deeper into the enterprise," NW, March 22).

"We will move to Notes 3.0 as fast as we can," said Neil Hennessey, director of corporate com-

munications at Reader's Digest Association, Inc., which has deployed Notes in editorial offices worldwide. "The Macintosh support and remote administration capabilities are key for us."

In addition to new client and server options, Notes 3.0 works with a range of new networking protocols, including Novell, Inc. NetWare's native Internetwork Packet Exchange (IPX), the Transmission Control Protocol/Internet Protocol, X.25, IBM's Systems Network Architecture and Apple's AppleTalk. The previous release used only the Network Basic I/O System for communicating across local-area networks.

Version 3.0 also features new administration capabilities, better support for Microsoft's Object Linking and Embedding technology. *(continued on page 12)*

AT&T adds video calling to PBX line

By Joanne Cummings
Senior Writer

BRIDGEWATER, N.J. — AT&T Global Business Communications Systems last week announced a PBX-based videoconferencing system that lets users share video and personal computer files from their desktops.

The system enables users to add video support to an Integrat-

ed Services Digital Network link and switch the calls through an AT&T Definity private branch exchange.

The AT&T Personal Video System Model 70 package consists of one card installed in the ISDN phone, two NCR Corp.-developed cards for the users' PCs and a camera that sits atop the PC.

It requires an AT&T Definity Generic 2 or 3 PBX or 5ESS switch, AT&T's ISDN phone, called the 8510T Voice Terminal, and any 386- or 486-based PC configured with Microsoft Corp.'s Windows 3.1.

Although intra-work group video calls are handled using ISDN Basic Rate Interface lines,

long-distance videoconferences can be established through the switch using plain 128K bit/sec digital links. Definity PBXs are required on both ends of the call.

The Model 70 supports the CCITT H.320 videoconferencing standard, also known as Px64, enabling it to communicate with any other standards-based videoconferencing system, such as the PictureTel Corp. Model 400 group conferencing system that AT&T sells under an OEM agreement.

When users wish to make a video call, they dial the other participant as they usually would. When the phone is answered on *(continued on page 9)*

AT&T to introduce SDN north of the U.S. border

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — AT&T and Unitel Communications, Inc. last week said they will begin controlled introduction of a virtual network service for users with sites in the U.S. and Canada in the third quarter of this year.

The AT&T Software-Defined Network to Canada (SDN Canada) will, for the first time, enable U.S. users to build virtual nets that extend across the border into Canada. AT&T said about 90% of multinationals in the U.S. have locations in Canada.

SDN Canada service will support staple virtual net features such as a seven- or 10-digit uniform dialing plan for sites in both countries, net management functions such as fraud control and traffic analysis reports.

AT&T said it will modify its

network to accommodate users with dialing plans ranging from three to 12 digits.

"It's not well known, but there are many companies out there with different dialing plans for their private networks," said Doug Macbeth, a group product manager with AT&T's Business Communications Services group. "We want to make their transition to SDN Canada as smooth as possible."

AT&T will serve as a single point of contact for ordering, provisioning and consolidated billing and will offer users a choice of paying in different currencies as well as customer service in either French or English.

Users in Canada will initially be able to access the service using dedicated links. AT&T plans to offer switched access in Canada later this year after the service becomes generally available.

AT&T would not say when the service will be generally available nor would it discuss pricing.

AT&T and Unitel said they will trial the service with customers including Digital Equipment Corp., Dresser Industries, Inc., Honeywell, Inc. and Hewlett-Packard Co.

SDN Canada is a step up from the carriers' previous virtual net services — Global SDN and Unitel's V-Route, which were linked in April 1991. Nearly 100 multinationals have chosen this service for their cross-border needs and now have the option of moving to SDN Canada. The carriers will continue to sell and support the Global SDN/V-Route service.

In January, AT&T acquired a 20% stake in Unitel, which gained the right to use AT&T's intelligent network software and switching and transmission equipment in its Canadian network. Unitel is in the process of installing AT&T Network Systems' 4ESS and 5ESS network switches across the country from which SDN Canada service will be offered. ■

Retix to improve support for SNA

continued from page 5

Logical Link Control 2 (LLC2) conversion module that will translate SDLC traffic into LLC2 frames that can be sent across an internet via source routing to a token ring-attached mainframe.

The vendor is obtaining the conversion capabilities from a third-party vendor but declined to name the firm.

Retix said it will also add by year end software to its entire router line that supports encaps-

Other SNA enhancements due out by early next year include software that will allow the router to locally acknowledge receipt of token-ring packets on behalf of the remote devices to which the packets are destined. That will prevent SNA acknowledgment and polling data from clogging wide-area lines and help keep SNA sessions alive while the router finds an alternate data path.

Retix said this feature will be compatible with IBM's Data Link Switching, a proposed standard for transmitting SNA data across TCP/IP nets.

Also, Retix pledged to support IBM's Advanced Peer-to-Peer Networking Network Node by early next year, thereby providing users with peer-to-peer routing of SNA traffic.

The vendor will also support IBM's NetView 6000, enabling users to manage the net via the Simple Network Management Protocol or IBM's NetView via IBM's AIX-based NetView gateway. The vendor will also support OSI's Common Management Information Protocol.

Retix pledged to support IBM's Advanced Peer-to-Peer Networking Network Node.



sulation of SNA data in Open Systems Interconnection Connectionless Network Protocol packets for transmission across the internet. That will aid in overcoming some of the deficiencies inherent in IBM's SRB protocol, including its seven-hop maximum.

Moving to TCP/IP

Most other router vendors encapsulate SNA data inside a Transmission Control Protocol/Internet Protocol envelope. Retix said it chose OSI because it has a large installed base of international and U.S. government customers, both of which adhere to the OSI format.

But the vendor said its routers will also support by early next year a TCP/IP-based encapsulation scheme for SNA.

Leading the ATM pack

On the ATM front, Retix plans to leapfrog the competition by shipping a native ATM interface for its 7000 series routers this summer. Most other router vendors will initially support ATM-like functions via an external data service unit from ADC Kentrox or Digital Link Corp.

The vendor also announced a joint development agreement with the Adaptive division of Network Equipment Technology, Inc. whereby Retix will use Adaptive's silicon chips for its router interface. That will enable the router to segment Ethernet, token-ring and Fiber Distributed Data Interface packets into 53-byte cells and pass it off to an ATM switch. ■

SynOptics adds hub mgmt. to Novell's NMS platform

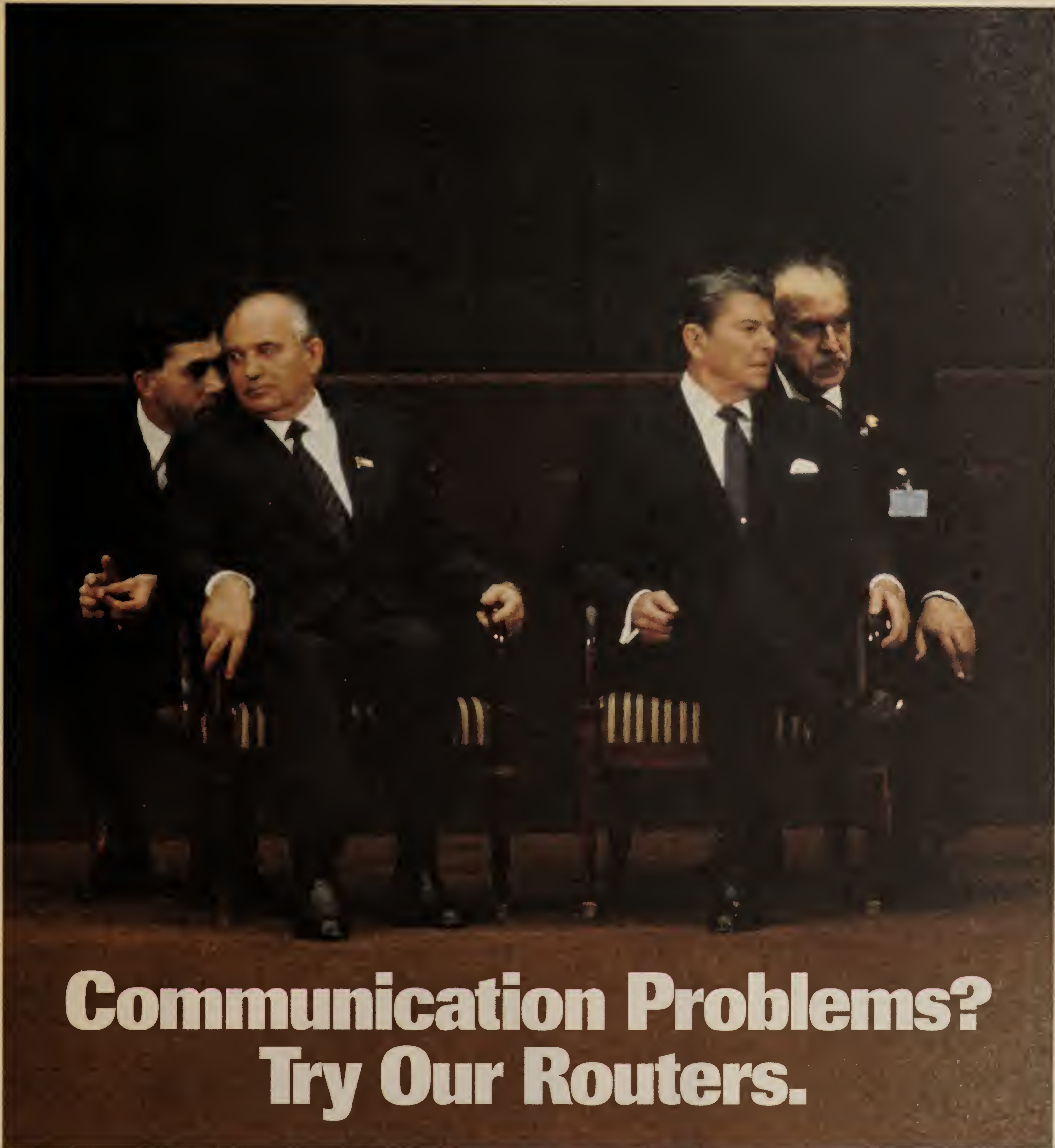
By Skip MacAskill
Senior Writer

SANTA CLARA, Calif. — SynOptics Communications, Inc. this week is expected to announce an application for Novell, Inc.'s NetWare Management System (NMS) that will enable NMS users to manage SynOptics' line of inter-networking equipment.

Optivity for NetWare, which will come bundled with NMS, supports Simple Network Management Protocol-based management for all SynOptics System 2000 and 3000 Ethernet and token-ring hubs from a central NMS console.

The hub maker also announced that, by year end, all of its Ethernet and token-ring intelligent hubs will support SNMP over Novell's Internetwork Packet Exchange (IPX) protocol in addition to the Internet Protocol, with the ability to automatically detect which protocol is being used.

"Net management is a complicated application, and users are looking for tools that will simplify that process," said Bill Lanfri, vice president of marketing for SynOptics. "Optivity for NetWare does that by allowing users to *(continued on page 13)*



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IBM expands arsenal for client/server

continued from page 1

achieving interoperability between IBM and non-IBM worlds," said an analyst who requested anonymity.

Based largely on existing middleware products from Systems Strategies, the new Messaging and Queuing Series (MQSeries) software will run on 10 computing platforms, including IBM MVS, OS/2, Tandem Computers, Inc. Guardian and Digital Equipment Corp. VAX/VMS. The product suite will support LU 6.2, Transmission Control Protocol/Internet Protocol and DEC's DECnet network protocols.

The MQSeries, like most middleware, gives developers an application program interface, which saves them from having to deal with a range of net protocols and operating system environments when building distributed applications. This makes it easier to integrate applications on different network and computing platforms.

For example, companies can use MQSeries to support downsizing efforts in which host legacy applications need to be integrated with applications on mid-range systems or LANs. MQI can also be used to expand the capabilities of IBM CICS applications.

It is unclear whether IBM will make MQI available as an option within CICS as some of its OLTP competitors have done. Unix System Laboratories, Inc., for example, recently announced a new feature within its Tuxedo transaction processing system that provides asynchronous messaging as an optional communications mode.

According to sources, MQSeries for IBM CICS/VSE, IBM AIX and DEC VAX/VMS platforms will begin shipping in September. The remaining seven platforms will be available in December.

Novell fills in details of Mac integration plans

By Caryn Gillooly
Senior Editor

SALT LAKE CITY — Novell, Inc. this week is expected to announce its first release of DataClub, software that will provide virtual server capabilities to Apple Computer, Inc. Macintoshes in NetWare environments.

But DataClub is only one step in a four-phase plan to better integrate Macintoshes into the NetWare environment, a plan the company mapped out at its BrainShare '93 developers' conference here.

Steven Nelson, vice president and general manager of Novell's NetWare clients group in Walnut Creek, Calif., used BrainShare to preview the forthcoming release of DataClub 3.0, the first version of the software released since Novell inherited it by acquiring International Business Software.

Although new and old products provide peer-to-peer capabilities to Macintosh clients on NetWare local-area networks, the

(continued on page 13)

Pricing for MQI products will start at \$3,000 for a single low-end platform. IBM will sell and support the MQI products, while Systems Strategies will provide back-end support.

Complementing the MQI announcement, IBM announced Version 2.0 of CICS for OS/2. The new version will run the full CICS transaction logic on an OS/2 server and support DOS, Windows and ASCII terminals as true CICS clients. IBM is working with Apple Computer, Inc. to provide a Macintosh client on CICS for OS/2, sources said. Downsizing CICS to LANs will

enable customers to support transaction-based applications.

Previous versions of CICS for OS/2 only supported OS/2 as a front end to CICS running on a host. As such, CICS for OS/2 was used primarily as a single-user development tool for building host-based CICS applications.

In contrast, the new version provides multiuser support and is geared to production rather than development environments. Providing full CICS functionality on OS/2 servers furthers IBM's goal of downsizing CICS applications to run on client/

server platforms.

Last fall, IBM announced its intentions of moving CICS onto two Unix platforms — its AIX on the RISC System/6000 and Hewlett-Packard Co.'s HP-UX. Analysts said IBM will ship the Unix versions of CICS as well as the new OS/2 version by June.

"Companies downsizing applications often say they wish IBM would move CICS to other platforms because that would make it easier to place application functionality and logic where it is most appropriate," said one analyst who wished to remain anonymous. □

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SunSoft to offer version of Solaris

continued from page 5

attracted to NetWare environments," said David Smith, director of Unix Systems and Software at International Data Corp. (IDC), a research firm in Framingham, Mass. "Solaris buyers tend toward technical environments."

That could change if Sun continues its push into commercial markets, but so far, that move "has not been one of the great commercial success stories," Smith said.

John Donovan, director of the groupware service at WorkGroup Technologies, Inc., a market research firm in Hampton, N.H., predicted that instead of Windows NT competing with Solaris x86, the hype surrounding the Microsoft product would stimulate interest in Solaris.

Answering a need

NT will make people ask, "What can I do with all those high-end desktops," Donovan said, and Solaris offers the answer — creating integrated business information systems with security features and central-

ized administration that NT cannot yet match.

Solaris offers the ability to create "real distributed applications, across some pretty powerful desktops," he said. Most personal computers running DOS and Windows just sit there waiting for keystrokes, he added, and Solaris' distributed architecture makes better use of the desktop CPUs.


To ease the transition, Solaris for x86 will also run DOS and Windows applications, although observers say there is a slight performance penalty. "That's important if Solaris is going to become a com-

mon client," Donovan said. "Users want to bring forward as many familiar applications as possible." The key, he said, is that "performance has to be comparable."

Donovan said Solaris demands a 486DX or a 386 with a 387 math coprocessor, lots of random-access memory, plenty of hard disk space and high-end video.

Solaris for x86 will include major enhancements, which will also be included in other versions of Solaris.

Solaris for SPARC costs \$795, but observers predicted a lower price for the x86 version.

At any price, Solaris for x86 presents a dilemma for Sun. Porting the operating system to the Intel platform opens up a new platform on which developers can create applications. But running Solaris on fast, low-cost PCs could also make the Pentium chip a more attractive alternative to Sun's own SPARC hardware, which observers say lags the performance of some other Reduced Instruction Set Computing architectures. 

AT&T adds video calling to PBX line

continued from page 6

the other end, a videoconferencing session is established and a window containing the full-motion color video captured by the cameras pops up on each PC. The product supports video frame rates between seven and 15 frame/sec, which is comparable to most room videoconferencing systems, the company said.


Users can share PC files by calling up any Windows-based file from within the NCR TeleMedia Connection application software and clicking on the button marked video. This sends the file to the other user, even if the recipient does not have a copy of the PC application.

The users can then interactively discuss and modify the document in one window, while viewing each other in another.

According to analysts, the Model 70 should compete well against local-area network-based desktop videoconferencing products such as Compression Labs, Inc.'s (CLI) Cameo system for the Apple Computer, Inc. Macintosh and IBM's Person-to-Person/2 System for its OS/2-based machines.

"AT&T's leveraging its strength in the PBX area and going beyond just voice and data to add video," said Elliot Gold, president of Telespan Publishing Corp. in Altadena, Calif. "It may possibly do an end run around others looking to do desktop videoconferencing, including people like IBM, because they say they understand how to network this."

Gold said the PBX solution is a logical choice for handling video calls, and said he is skeptical of LAN-based solutions. "Under heavy load conditions, I'm not convinced the quality of the conference will not suffer [in LAN-based products]," he said, although he had not yet seen a demonstration of the AT&T product.

The Model 70, which will be available this fall, is priced at \$6,995 per user. This is slightly higher than the CLI and IBM wares. The Cameo costs about \$5,000 per user, and Person-to-Person/2 with the video option is priced at about \$4,000 per user. 

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Novell to go native with TCP/IP support

continued from page 1

services over whichever protocol best suits their needs.

"NetWare/IP provides full interoperability between IP- and IPX-based workstations and servers," said Keith Brown, manager of technical marketing at Novell. "And it paves the way for running NetWare over other protocols."

Today, customers can run NetWare in Transmission Control Protocol/Internet

Protocol environments by using IP tunneling provided through a NetWare Loadable Module (NLM) called IPTunnel. IP tunneling basically provides point-to-point IPX links over TCP/IP.

This benefits customers by letting them transfer information over TCP/IP networks but still requires the use of IPX, a requirement that has raised performance concerns.

According to one attendee at the conference last week, "IP tunneling is a dog," a sentiment echoed by others.

Robert Davis, vice president and gener-

al manager at Novell, contends that the problem with IP tunneling is not that it is slow but that the technology does not scale to larger networks.

The way NetWare nodes know about one another and the services each offers is through the Service Advertising Protocol (SAP), which is used to broadcast information about the network through the network.

TCP/IP, however, does not allow broadcasting, meaning NetWare nodes in a TCP/IP environment must use another method to share information. With IP tun-

neling, servers send updates to one another directly, without broadcasting.

As networks grow, more server-to-server messages need to be sent, ultimately causing congestion on the network, making IP tunneling a less than viable option for larger NetWare nets.

"One of the primary design goals [of NetWare/IP] was to get around the scalability issues involved in tunneling," Davis said.

Native support

The NetWare/IP product, which Novell

Novell rolls out new net-ready DR DOS version

SAN JOSE, Calif. — Novell, Inc. last week brought Digital Research, Inc.'s DR DOS closer under its wing with the release of a new version of the product called Novell DOS 7.

The product, to be available this summer, is said to be more network aware than previous versions of DR DOS, with such features as new peer-to-peer capabilities, integrated NetWare client support, a network management agent, preemptive multitasking and enhanced security.

Enhanced security seems to be top on Novell's list of selling points for the new operating system. According to the company, Novell DOS gains some of its primary benefits from DOS Protected Mode Services (DPMS).

DPMS is an application program interface (API) that will let third parties develop device drivers and terminate-and-stay-resident programs that can reside in extended memory and execute in protected mode on Intel Corp. 80286-, 80386- and i486-based computers. This will let developers add functionality to clients while reducing the conventional memory requirements for their programs.

But it is also the additional networking features that Novell hopes will make it a contender in the desktop operating system market. Novell DOS 7 will run natively within a NetWare environment without adding a NetWare client shell.

Novell has also built in a capability to let clients share files without the help of a server. In addition, the company included a net management agent so a central management console can get configuration and error information from that client.

"Novell DOS 7 will increase our lead over the competition in providing advanced DOS system software," said Steve Tucker, vice president and general manager at Novell's Desktop Systems Group, based here.

The DPMS API is available now as a software developers' kit for \$195. Novell DOS 7 is expected to ship this summer, although pricing was not yet available. ☐

— Caryn Gillooly

Secrets of the

Secret #2:

Mastering Time and Space

Long ago, a King ruled a vast kingdom connected by a great enterprise network. Because his prosperity depended on the network, he employed advisors to keep him abreast of its status throughout the kingdom.

His chief counselor spoke. "Your Majesty, we have a crisis at our remote site in the great swamp. We should have a full report next week. Other advisors are investigating the slowdown at the mountaintop retreat. And the castle server is almost back to full efficiency."

"This is ridiculous! Is there no way to know what is going on without sending advisors to the far reaches of my realm?"

"I'm afraid that is the best we can do. Unless," smirked the advisor, "Your Majesty has a Crystal Ball with which to master time and space and see the future."

Before dawn, the King set off on a journey. Far and wide he searched, until at last he came to a prosperous valley with a unique network that employed frame relay, X.25, and circuit switching—all in a single architecture. "Surely," he thought, "this kingdom must have a Crystal Ball."

Become a Wizard of I.T. and master time and space on your network.

is hoping to have ready by the end of the year for NetWare 3.11 customers, will have both client and server components.

The server software will consist of a set of NLMs and a TCP/IP stack, which together will provide NetWare services to clients using TCP/IP or IPX. The only client TCP/IP stack that the server will support is the stack found in Novell's existing LAN WorkPlace product. The company, however, does plan to add support for other vendors' client TCP/IP stacks in subsequent releases.

NetWare/IP skirts the SAP problem

through use of two primary NLMs: a Domain Name System (DNS) NLM and a Domain Server for SAPs (DSS) NLM, each of which can be loaded on a NetWare server or on individual machines.

The DNS is something found in the Unix world and is present on any TCP/IP-based network. The DNS is basically the keeper of host and other information about the network, such as routing tables, name tables and internetwork addresses.

The DSS NLM serves as the "central repository" for all SAP information. Instead of broadcasting SAP information to every

network node, all SAPs are sent to the centralized DSS.

When a user plugs into a TCP/IP network, the connection is automatically established with the DNS to find the address of the nearest DSS. The user then logs on to the DSS to access necessary NetWare services.

Long time coming

According to conference attendees, NetWare/IP has been a long time in coming. "Customers have been pounding down the doors for this," said one third-

party developer who asked to remain anonymous. "The more protocols you have, the more expertise you need to understand the semantics of each protocol."

The company plans to have a beta release of NetWare/IP for 3.11 ready by the end of the summer and plans ultimately to have a version out for NetWare 4.0. ☐

Novell reveals other futures at BrainShare

SALT LAKE CITY — In addition to discussing the details of NetWare/IP, Novell, Inc. in various sessions throughout the week revealed directions for some of its other products.

For starters, Novell is planning to beef up its NetWare for SAA IBM connectivity software. According to Dave Holbrook, product line manager at Novell, the next release will be based on the directory services found in NetWare 4.0.

"A big focus of the next release will be more centralized management," he said. "We're [also] working on more automation," letting the system take the first two or three steps necessary to respond to an alert — the steps administrators have to do manually.

Holbrook added that Novell is also moving to support LU-to-LU connections, and NetWare for SAA "will soon be able to get alerts from IBM's LAN Network Manager."

The next major release will also have the capability to support 1,000 sessions — almost twice the number available today, Holbrook said.

Novell also gave some indication of the directions it is taking with the NetWare 2.X and NetWare 3.X product lines, making it clear that the 2.X line is being phased out.

"We will continue to sell [NetWare] 2.2 as long as customers continue to buy it . . . [but] there are no new releases planned," said Gordon Smith, senior product marketing manager at Novell.

"Our objective is to accelerate the rate of migration to 3.X," Smith said. "For those of you still selling products to 2.2 [customers], now's the time to move to 3.11. The installed base of 2.X [customers] is falling off quite rapidly."

On the 3.X side, although Smith would not confirm the existence of NetWare 3.12 ("Amid the 4.0 hype, Novell bucks up 3.X," *NW*, March 8), he did say the company has future releases in the 3.X line planned.

Smith also said that with the release of NetWare 4.0, the 500- and 1,000-user versions of 3.11 that were available in limited release, will no longer be available. He added that Novell will migrate its SFT III server mirroring product to the 4.X platform, although he did not say that they will phase out availability of SFT III with 3.X products. ☐

— Caryn Gillooly

Wizards of I.T.

He found his way to the tower of the Wizard of Information Technology and described his quest.

The Wizard smiled. "O King, once our network was like yours. But then, a new integrated switching solution made me a Wizard of I.T. Now I simply rely on my Netrix Network Management System. From my tower I can run diagnostics, gather reports, and even troubleshoot problems at the farthest reaches of my network—all with a simple point and click."

"But there is no Crystal Ball?"

"Nor any need for one." On his monitor, the Wizard summoned the image of a switch in the southernmost corner of the kingdom. "I can see what is connected to this switch, and what data is travelling through it. I can even examine the path this packet is taking through the network. Behold, we travel through time and space without leaving this room."

Said the King, "This is mastery indeed! I see it as though I stand beside it! Can you teach this to my advisors?"

"Do as I have," the Wizard replied, "and you will become a Wizard of I.T. in your own right."

So the King learned to master time and space, and eventually to transform his network with magical ease.

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IBM to add routing features to 8250

continued from page 5

"Bringing the routing and bridging technology onto the hub will save users from having to buy three separate boxes to do those functions, and it will simplify their networks," said Anura Guruge, an independent strategic analyst in New Ipswich, N.H.

IBM's Mark Knittel, director of network integration, said the firm will add "select features" of its 6611 router technology to

the 8250 in the fall. He would neither confirm nor deny that DLS and SDLC-to-LLC2 would be among the first features added.

Knittel did say IBM will make the 8250 compatible with the 6611 so the 8250 can be more easily integrated into enterprise environments.

IBM will add additional bridging functions to the 8250 that will let users bridge traffic between a mix of Ethernet, token-ring and Fiber Distributed Data Interface LANs, Knittel said. Currently, the hub supports only source routing and source routing transparent bridging for token-ring

LANs and transparent Ethernet bridging.

It was unclear whether the IBM routing and bridging technology would be integrated into Chipcom's ONline System Concentrator hubs, on which the 8250 is based. Chipcom executives could not be reached for comment by press time.

DLS would extend ONline's integrated routing functionality by allowing it to handle SDLC traffic in addition to the raft of popular protocols currently supported.

The hub routes those protocols between Ethernet segments via three different integrated modules, which are based

on Cisco System, Inc.'s IGS router.

Ungermann-Bass, Inc. is the only other major hub vendor to announce support for DLS, and it has not yet decided how or when DLS will be integrated into its Access/One intelligent hub.

The company is likely to support DLS using Access/Open and in future software releases for its bridge/router products, according to Michele McGregor, marketing manager for the Access/One business unit. □

Notes 3.0 debuts amid much fanfare

continued from page 6

ogy, new graphical interface tools and integration of Notes services into Lotus applications, such as its 1-2-3 spreadsheets. It provides selected and background replication services, document versioning, text search and retrieval capabilities, and a utility for querying Notes and SQL databases.

While Notes 3.0 supports basic work flow and forms routing capabilities, it does not incorporate a full-fledged work flow engine or work flow design tools. Lotus officials said work flow add-on products are being developed by Action Technologies, Inc. and will be announced later this year.

Lotus is hoping that Notes' new features and cross-platform capabilities will help the product become as essential to work group computing as word processors and spreadsheets have become to personal productivity, according to Manzi.

"Notes has become the centerpiece of our strategy as a company," he said. "Having a great word processor and spreadsheet is only half the battle."

Porting Notes to Windows

To build a full Notes server on top of Windows, Lotus added a thin layer of software to the product that provides memory and task management services found in more robust operating systems. To run Notes Server for Windows, the company recommends a 386 or 486 personal computer with a 200M-byte hard disk and 12M-byte memory.

The Notes Server for Windows supports as many as 10 clients running on NetWare, Microsoft LAN Manager and Windows for Workgroups LANs. It will be available in April for \$495.

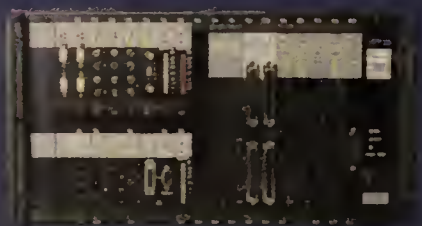
To boost sales of Notes among small businesses or departmental work groups, Lotus is offering a Notes Starter Pack for \$995, which consists of a Windows 3.1 or OS/2 server and two Windows clients.

Lotus also announced a Business Partners program to assist resellers, systems integrators and consultants who want to develop or sell value-added versions of Notes to customers. Lotus plans to establish 40 training centers by year end.

Notes' client/server software for Windows NT, SunSoft, Inc.'s Solaris, Hewlett-Packard Co.'s HP/UX, IBM's AIX and The Santa Cruz Operation, Inc.'s SCO Unix is scheduled for release in the second half of this year. A Notes server running as a NetWare Loadable Module within NetWare 4.0 will also be available in the second half of the year. □

Cunningham is a correspondent for IDG News Service.

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Novell fills in Mac integration plans

continued from page 8

old product "turned every user into a network administrator," Nelson said. Each user had to assign access rights to files and services for other users and users had to log on to individual machines to access resident services.

With DataClub 3.0, users log on to a single virtual server. "This gives you peer-to-peer economy with the ease of use of a central server," he said.

SynOptics adds hub mgmt. to NMS

continued from page 6

manage their systems and network fabric from one platform on one console."

Optivity for NetWare is a core set of services and utilities that allows the NMS operator to monitor and control all SynOptics hubs on the network. It has an autodiscovery feature, which automatically finds the hubs and builds a graphical map for the manager.

The application also includes the Expanded View and Ring View capabilities for Ethernet and token-ring networks, respectively, which enable managers to click on a hub and discover the attached end nodes.

Other features include SynOptics' Management Information Base browsing tool, which collects SNMP information and displays it in graphical or tabular form, and an alarm collection tool, which lets the manager pool alarms for analysis.

Novell sees the integration of Optivity for NetWare as an important piece of its strategy to expand NetWare's position in the market.


"We want to be considered an enterprise supplier," said Kanwal Rekhi, executive vice president of Novell's interoperability systems group. "To accomplish that, we have to provide a migration path for our users who are building enterprisewide LANs. SynOptics makes that transition easier with the Optivity application."

Analysts agreed that the partnership is beneficial to both companies.

"From SynOptics' perspective, this is a good announcement because they needed to get closer to the Novell user," said Charlie Robbins, director of communications research for Aberdeen Group, Inc., a market research firm in Boston. "For Novell, it was essential that they get this type of support from the hub vendors because their ultimate goal is to make NetWare 4.0 an enterprise system. This is just the first of several similar announcements that are coming down the road."

Cabletron Systems, Inc., for example, has several applications under development geared to NetWare users.

"Cabletron has every intention to support NMS," said Michael Hart, manager of product marketing for OEM products at the hub maker. "We're not only developing an application to run on top of NMS, but we're also working on managing Novell file servers under our own Spectrum net management platform." Hart declined to provide a specific time frame for when those products would be available.

Available next month, Optivity for NetWare costs \$3,495. 

Nelson also mapped out a more intricate plan for future Macintosh/NetWare integration. The company has, to date, focused on bringing Macintosh capabilities into NetWare, but, he said, "The time is right to take the NetWare architecture and put it on the Macintosh."

The first step in that plan, Nelson said, is the release next month of MacIPX, an Internetwork Packet Exchange (IPX) transport protocol stack for the Macintosh originally announced ("Macs to play peer role in NetWare nets," *NW*, Dec. 21, 1992).


The second phase in the plan is to release a set of application program interfaces called NetWare System Services for Macintosh (NSSM). NSSM will enable third parties to build Macintosh applications capable of accessing NetWare services.

"[NSSM] will provide Macintoshes native access to file services by way of [Novell's NetWare Core Protocols]," said Douglas Kerr, software engineering manager at Novell. "You won't need AppleTalk at all to do this."

Although no specifics were available, Nelson estimated the first NSSM software

developers' kits would be out before the end of the year.

The last two phases — which Nelson estimated were more than a year off — are a NetWare client that provides Macintosh connectivity and a version of Personal NetWare for the Macintosh.

The former will give a client on a NetWare network the capability to be a full citizen on a Macintosh network, while Personal NetWare for the Macintosh will let Macintosh clients participate in Novell's multiplatform peer-to-peer environment promised with Personal NetWare. 

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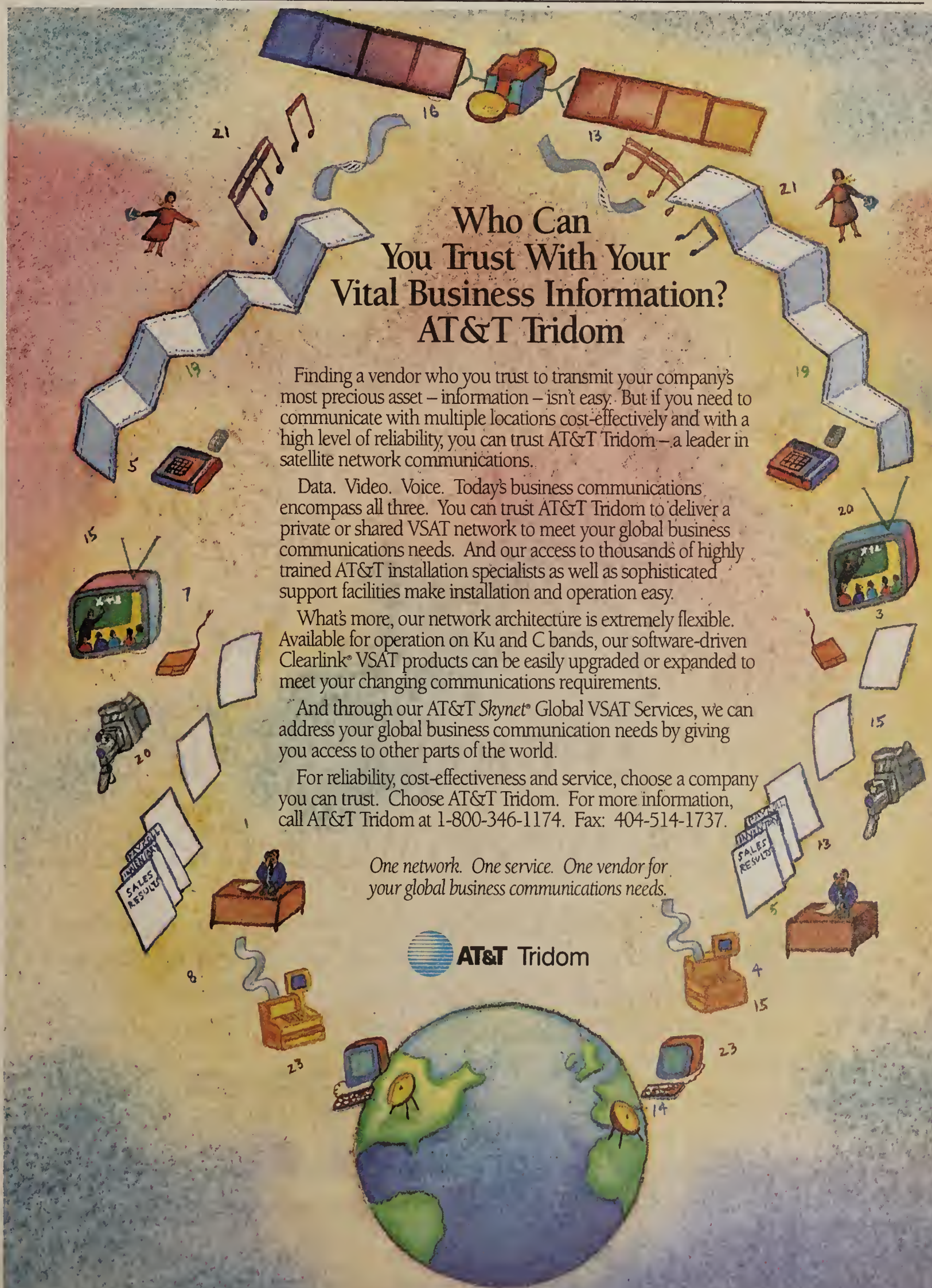
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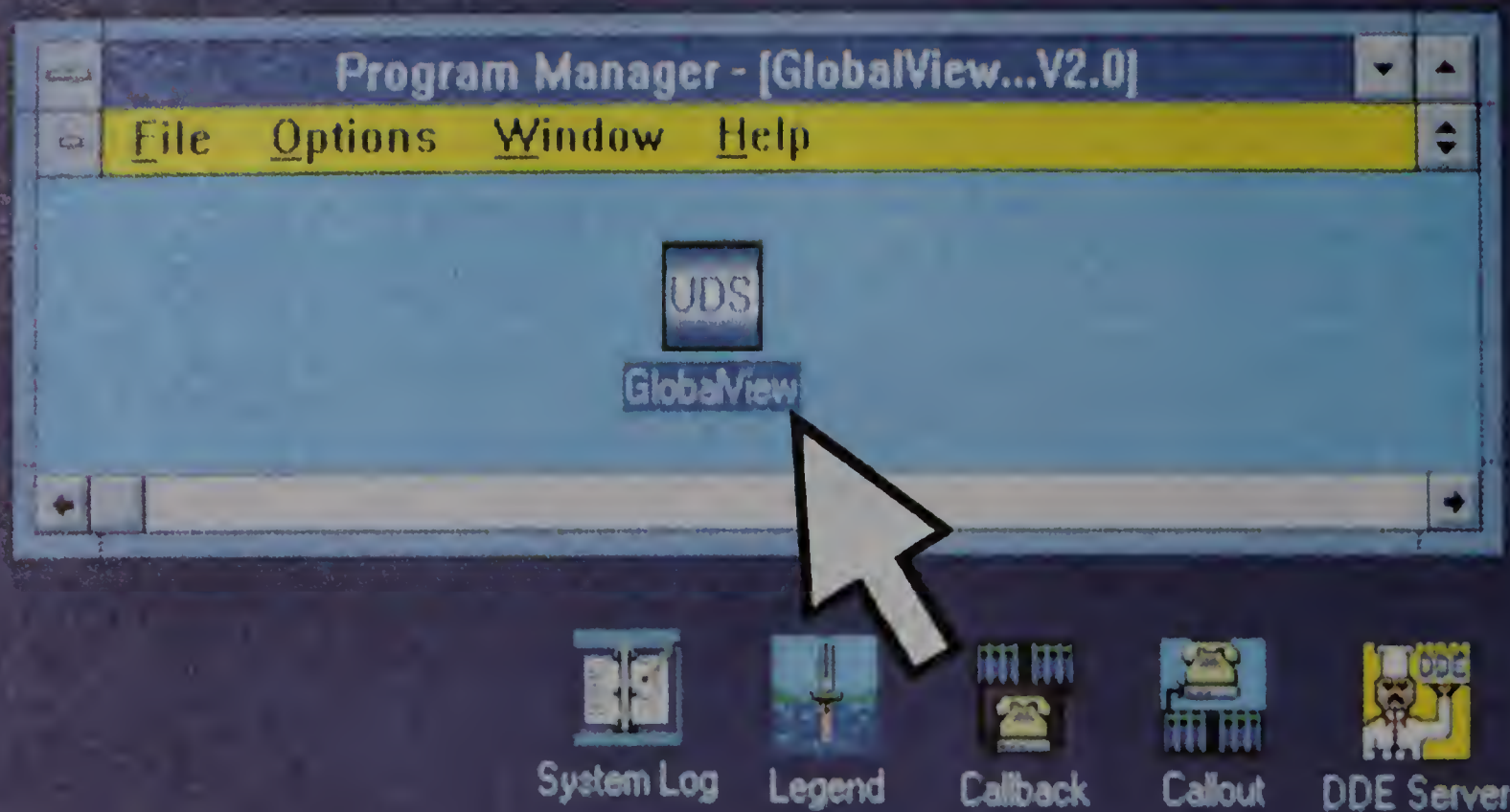
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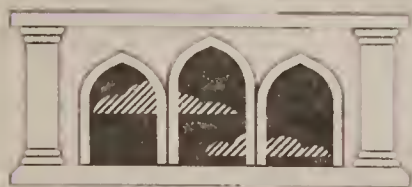




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Worth Noting

“We’re almost out of the business of selling [NetWare] 2.X in the U.S.”

Gordon Smith
Senior product
marketing manager
Novell, Inc.
Provo, Utah

Netnotes

Novell, Inc. last week announced that its 32-bit Open Data-link Interface (ODI) net server drivers will run on all major desktop operating systems, including UnixWare, Windows NT, Windows 3.1, OS/2 and 32-bit DOS desktop clients, as well as its own NetWare 3.X and 4.0 servers.

The new systems support is currently available via a Novell ODI driver development kit.

The company also announced that its enhanced drivers can communicate with Microsoft Corp.’s Network Driver Interface Specification (NDIS) driver via Novell’s ODINSUP module. That eliminates the need to develop NDIS drivers for an adapter when connecting into Microsoft’s LAN Manager or LAN Server.

The ODINSUP module can be licensed from Novell.

Ungermann-Bass, Inc. last week rolled out a new 32-bit Extended Industry Standard Architecture Ethernet adapter card for file servers and high-speed workstations.

The UB-UTP32A, which has a bus-master architecture and supports 10Base-T and 10Base5 Ethernet, is software-configurable and offers an automatic cable selection feature.

Network driver support includes Novell, Inc.’s NetWare, Microsoft Corp.’s LAN Manager and The Santa Cruz Operation, Inc.’s SCO Unix.

(continued on page 19)

Sun ups Windows support on new version of PC-NFS

Sockets, Windows for Workgroups support added.

By Fredric Paul
Senior Editor

CHELMSFORD, Mass. — Sun Microsystems, Inc.’s SunSelect business unit last week introduced a new version of its PC-NFS networking software that features enhanced support for Microsoft Corp.’s Windows.

iar desktop environment, PC-NFS lets users share network resources and develop and run distributed client/server applications.

New Windows features include support for the Windows Sockets application program interface (API), developed by Microsoft, Sun and several other companies. Support for Sockets means any Windows application written to the API work unchanged with PC-NFS 5.0 and any TCP/IP network, said John Keyes, SunSelect’s product manager for NFS.

PC-NFS 5.0 also includes a driver for Windows for Workgroups. Similarly, upcoming releases of Windows for Workgroups will include the new PC-NFS driver.

While sales of Windows for Workgroups have been disappointing, Keyes said “quite a few of our beta customers are asking for Windows for Workgroups support.”

The new version of PC-NFS adds Windows versions of such TCP/IP services as the File Trans-

(continued on page 19)

“Quite a few of our beta customers are asking for Windows for Workgroups support.”

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PC-NFS Version 5.0 includes both networking software designed to integrate personal computer users into Transmission Control Protocol/Internet Protocol or Sun Open Network Computing/Network File System (NFS) networks as well as NFS support in a single package. From a famil-

OSF reworks DCE pricing to attract wider user base

By Fredric Paul
Senior Editor

SAN FRANCISCO — The OSF has announced new pricing that promises to make its Distributed Computing Environment (DCE) a more attractive platform for PC hardware and software vendors and, ultimately, more prevalent in end-user shops.

The Cambridge, Mass.-based nonprofit organization also revealed a three-year multimillion dollar research contract from the Defense Advanced Research Projects Agency (DARPA).

Beginning May 15, the Open Software Foundation, Inc.’s new pricing structure will allow software and hardware vendors to buy annual licenses that entitle them to ship unlimited copies of DCE, rather than having to license each copy individually. That change is designed to entice more vendors to take advantage

of DCE standards, especially in the high-volume, low-margin personal computer business.

Observers suggest that Microsoft Corp. may be interested in bundling DCE with its upcoming Windows NT, and Novell, Inc. might do the same with its new NetWare 4.0.

“There’s been a blurring of the distinctions between workstations and PCs,” explained Jon Gossels, OSF’s business area manager for DCE. The standard has enjoyed strong interest from PC vendors, Gossels said, but DCE’s 2-year-old prices “were not set for high-volume, low-margin platforms.” On the PC, DCE was “just too expensive.”

The new structure is designed to change that. Vendors will be able to buy a license for \$500,000 per operating system that will enable them to ship as

(continued on page 18)



PHOTO ©1993 STEVE BOORNS

“Customers need to secure the [NetWare server] console from people who don’t have the rights to those resources.”

Jan Newman

Executive vice president and general manager
Novell, Inc.’s NetWare Systems Group

NetWare break-in offers security lesson

User experience points to the need for physical security in addition to password protection.

By Caryn Gillooly
Senior Editor

MCLEAN, Va. — Administrators at The Riverbend Group, Inc. got a harsh security reminder earlier this month when an employee discovered a way to break into the company’s Novell, Inc. NetWare LAN.

Although the “break-in” was by a computer instructor during a training session and was more experimental than anything else, it was a reminder to The Riverbend Group — and should serve as a reminder to all other network administrators — that physical security is just as important as having a password.

“The key here is that for full security, you really need to have your file server locked up,” said a spokeswoman from The Riverbend Group here. “Password protection is not enough; system managers need to have physical security in place.”

The break-in occurred during a training session when a supervisor password was inadvertently set and the instructor had to find a way to get around it in order to regain control of the system, said Jan Newman, executive vice president and general manager at Novell’s NetWare Systems Group. Newman discussed the problem at length with The Riverbend Group.

“Basically, they dismantled the [SYS.] volume [at the server], renamed it and brought the volume back up,” Newman explained.

The SYS. volume contains all of the core NetWare operating information.

Once the newly renamed volume was brought back up, the sys-

tem thought it was a new volume and prompted the user to create a supervisor password. After doing so, the operator had full supervisor-level access to the server and the network.

According to John Simons, the Riverbend Group instructor that got into the system, it was surprisingly easy to get around the supervisor rights. “In less than 45 seconds, you can get into the system as a supervisor,” he said. “This is so very simple you can probably train a dog to do it.”

Newman said the proper im-

“The key here is that for full security, you really need to have your file server locked up.”

▲▲▲

plementation of NetWare 3.11 security features would have prevented such an occurrence.

“This would not have been possible if they had a password on the console, if the keyboard was locked and if the server was put in a secure room,” Newman said. “We tell customers they need to secure that console from people who don’t have the rights to those resources.”

Top priority

There are certainly thousands of users that do not keep their NetWare consoles in a locked room and are not concerned

(continued on page 19)

IBM, NatSemi to roll out isoENET products early '94

By Joanne Cummings
Senior Writer

SANTA CLARA, Calif. — IBM and National Semiconductor Corp. have announced that the first products based on their recently approved isochronous Ethernet proposal should be available in the first half of next year.

The proposal, called isoENET, was recently approved by the IEEE 802.9 committee, which is examining high-speed local-area network technologies. IsoENET is designed to support multimedia and interactive videoconferencing applications over LANs by layering Integrated Services Digital Network-like circuit-switching capabilities on top of traditional 10M bit/sec Ethernet ("NatSemi, IBM offer multimedia Ethernet," *NW*, Nov. 23, 1992).

The technology, which will require new hub cards and workstation adapters, utilizes time-division multiplexing technology at the LAN hub to deliver 10M bit/sec Ethernet and 6M bit/sec of circuit-switched bandwidth over

the same physical wiring.

Because it uses circuit-switching technology, isoENET LANs will easily connect to other nets and services based on that technology, said Richard Brand, strategic marketing manager at National. These include emerging Fiber Distributed Data Interface-II LANs and wide-area ISDN links.

"This is important because many interactive multimedia applications need to be able to traverse the wide area without introducing delays," Brand said. "If I want to talk with someone on my LAN, many times I can just walk down the hall. But the real advantage in PC videoconferencing is being able to communicate with people on the LAN as well as in other countries or companies."

Building partnerships

Joe Panella, program manager at IBM's Entry Systems Technology Division in Boca Raton, Fla., said the two firms are concentrating on building vendor partnerships in order to bring isoENET products to market. For

example, IBM is looking to partner with net operating system companies, such as Microsoft Corp. or Novell, Inc., to provide the application program interfaces and protocols necessary to support isoENET, he added. However, Panella declined to say when these partnerships would be announced.

IBM is working with National to develop the chipsets necessary for isoENET, he said, and has partnered with Ascom Timeplex, Inc. to build isoENET hub, bridge, router and gateway products. In addition, he said IBM will soon announce partnerships for building CCITT Px64-compliant coder/decoders designed to support the technology.

"We're also actively pursuing alliances with multimedia application vendors," Panella said. "Until now, they've had to concentrate on stand-alone solutions because there was no real end-to-end network infrastructure to support those applications."

The firms said isoENET LANs will be fully backward-compatible with 10Base-T LANs. The companies did not detail pricing except to say that IsoENET products will cost significantly less than double the cost of 10Base-T offerings. ■

OSF reworks DCE pricing

continued from page 17

many copies of the DCE Release 1.0.X Executive as they wish. In addition, for \$50,000, companies will be able to distribute DCE client/server object code to all of their independent software vendors (ISV).

For \$100,000 a year per operating system, companies can buy the right to unlimited distribution of DCE Release 1.0.X Administration Tools object code.

ISVs that want the DCE source code can buy it for \$25,000 if they do not plan to include the binary code in their product or for \$250,000 if they do want the binary code. The higher price includes the DCE validation test suite, which alone costs \$20,000. Both prices include initial certification of the company's first DCE implementation.

The new plan will mean much lower fees for vendors shipping large quantities of DCE, which in turn will increase its availability and cut costs to end users. For example, if a company shipped 1 million copies of DCE under the old pricing plan, it might have had to pay fees totaling as much as \$5 million, Gossels said, com-

pared to a flat \$500,000 under the new plan.

In addition to lower royalty fees, the new plan slashes license administration costs. By allowing companies to buy unlimited licenses, "To a great extent, we've eliminated [administrative costs]," Gossels said.

The per unit pricing options will still be available for companies that distribute DCE on a high-end, low-volume basis.

Initial feedback on the new pricing has been "extremely favorable," Gossels said.

The new deal with DARPA, meanwhile, will fund OSF's Research Institute in work on prototype versions of OSF/1 incorporating the Mach microkernel technology. The goal is to create a series of highly modular distributed operating system prototypes with experimental extensions for real-time and high-trust operation.

The new system will scale to hundreds, even thousands of nodes, or processors while application software continues to run without modification, said Ira Goldstein, vice president of research and advanced development at OSF. Goldstein would not give the exact size of the software development deal. ■

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Netnotes

continued from page 17

Available now, the adapter costs \$759.

NetWorth, Inc., based in Irving, Texas, last week unveiled the UTP16B, a 16-bit Ethernet network interface card for Industry Standard Architecture-based personal computers and workstations that supports both unshielded twisted-pair and thick-wire cable connections. The card is software-configurable, allowing the user to set interrupt levels, I/O addresses and other configuration parameters. Available now, UTP16B is sold in 20-card bundles at \$169 per card.

Pacer Software, Inc. of La Jolla, Calif., last week announced PacerTerm Version 2.0, an upgraded version of the company's Macintosh terminal emulation program designed to work with VAX and Unix computers. The new version adds VT-320 emulation, color and tall-screen support, new scripting commands, better scripting performance and programmable screen buttons. A new File Transfer Protocol tool, PacerFTP, can send and receive multiple files over Transmission

Control Protocol/Internet Protocol connections. PacerTerm 2.0 is available immediately for \$249. Current PacerTerm users can upgrade for \$14.95 to \$49.95, depending on when they bought the product.

Alcom Corp., based in Mountain View, Calif., this week is scheduled to announce its LanFax Redirector 2.1-GL facsimile server software, designed expressly for GammaFax boards. The new server supports as many as 32 lines and boasts enhanced inbound routing capabilities and support for the TIFF file format. The new server runs on most popular local-area networks, including NetWare, VINES and LAN Manager. The server software runs on a dedicated 386 or higher personal computer with DOS 5.0, 2M bytes of random-access memory, an 80M-byte hard drive and GammaFax fax cards. It supports DOS and Windows clients, and is available with Alcom's FaxManager interface. The software is available immediately in versions for 25-, 50-, 100- and 250-user sessions. A 50-user version lists for \$2,995, while the 100-user version costs \$4,995. The FaxManager interface costs \$999 per LAN. ☐

Sun increases Windows support

continued from page 17

fer Protocol (FTP) and the Telnet virtual terminal standard. Previously, users had to return to DOS to use such functions.

On-line help for all Windows capabilities is included in PC-NFS 5.0, and a Windows NT version of the product is also in the works.

Microsoft will support the use of PC-NFS 5.0 on all Windows platforms. The two companies' customer-support organizations are sharing technical informa-

tion, Keyes said.

Version 5.0 also improves integration with Novell, Inc. NetWare. PC-NFS 5.0 and NetWare can now coexist on the client without the need for a third-party interface. According to Keyes, the Windows file manager now shows NetWare and NFS network drives, and allows drag-and-drop file exchanges between them. Additionally, PC-NFS 5.0 supports Network Basic I/O System on top of TCP/IP.

Server-based licensing lets users install and manage both permanent and temporary licenses

from SPARCservers. This approach saves administration costs and allows companies to buy only as many licenses as will be used concurrently. Under the old system, they would have to buy a license for every seat.

PC-NFS 5.0 is available immediately at prices ranging from \$415 for a single license to \$60,000 for a 500-license pack. Through June, SunSelect is also offering a \$79 upgrade to current users of PC-NFS and competitive products, such as FTP Software, Inc.'s PC/TCP and Novell's LAN WorkPlace for DOS. ☐

NetWare break-in offers lesson

continued from page 17

about company employees breaking into the system. Edwin Wilk, network manager at WHDH television station in Boston, is one.

"We have one server in a room with a lock, but we have two others in a room with no door, accessible to anybody who walks by," Wilk said. "I consider [physical security] a people issue."

The Riverbend Group incident was a deliberate act performed by someone very familiar with the

inner workings of NetWare, Wilk said, a combination he does not think is common at WHDH.

But at larger companies, or at those in which users are network savvy, the consensus is that physical security is a top priority and as important as implementing user passwords.

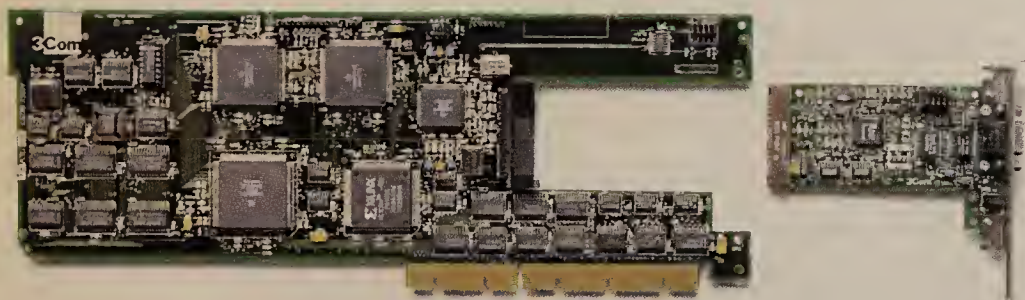
"If you don't love everyone you work with and you don't have physical security in place, you're gambling," said Marvin Raab, a private consultant in Mountain View, Calif. "It's like having a storefront business and not locking your door at night, assuming people are honest and won't go

into your store when you're not there."

Greg Scott, computing services manager for the College of Business at Oregon State University, in Corvallis, Ore., agreed. "So much of security is mindset," Scott said. "Novell nets tend to run on relatively inexpensive boxes, but people don't think about the value of the data on those machines."

"Novell's been up front about the need to keep people's hands off these machines," Scott said. "As long as your system is physically controlled, security in 3.11 is good." ☐

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LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

Worth Noting

“We need some common API that will let us do manger-to-manager communications between our WAN and LAN worlds. Ultimately, someone has to bridge that gap.”

John Scoggin
Supervisor of network operations
Delmarva Power & Light Co.
Newark, Del.

Link Notes

Cisco Systems, Inc. last week announced a worldwide marketing alliance with telecommunications supplier Ericsson, whereby Ericsson will resell Cisco's complete line of routers.

In addition, Cisco announced a joint marketing and support alliance with **MCI Communications Corp.** under which Cisco's router technology will be incorporated into MCI's new HyperStream data services — which includes frame relay and Switched Multimegabit Data Service.

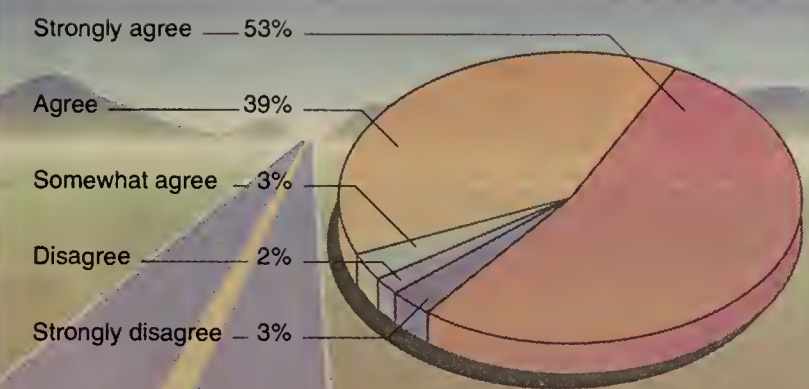
NetWorth, Inc. last week rolled out an Ethernet Multi-Segment Module (MSM) for its Series 4000 intelligent hub that supports 24 RJ-45 10Base-T ports. The ports can be divided into three eight-port Ethernet segments.

The company also unveiled a 24-port MultiSegment Management Module (MSMM), which can be used to control all other MSMs in the hub. The MSMM also supports 24 10Base-T end devices via RJ-45 connections.

Available now, the MSM costs \$2,395, while the MSMM is priced at \$3,395.

(continued on page 23)

Constructing a national electronic highway



A majority of the 269 users surveyed at INTEROP 93 Spring agree that the "information highway" backed by Vice President Al Gore is critical to future U.S. success.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: MILAN TECHNOLOGY CORP., SUNNYVALE, CALIF.

BT teams up with HP, Sun for LAN/WAN management

Seeks to develop manager-to-manager interfaces.

By Skip MacAskill
Senior Writer

LONDON — The bridge being built to span the gap between the management of local- and wide-area networks received a second plank in as many months last week when BT announced that it will work with two leading platform vendors to provide integrat-

The interfaces will provide links between Concert and OpenView and SunNet Manager.



ed LAN/WAN management.

BT will team up with Hewlett-Packard Co. and Sun Microsystems, Inc. to develop products that will allow users to manage their LANs in conjunction with BT's WAN services.

The announcement comes on the heels of a similar agreement between Microsoft Corp. and Infonet Services Corp. under which the companies will use Microsoft Windows NT technology to extend the management capabilities of Infonet's LAN internet service ("Infonet joins Microsoft in LAN mgmt.," NW, Jan. 25).

Under the BT deal, the three companies will develop interfaces based on the Common Management Interface Protocol and conform to the Network Manage-

ment Forum's Open Management Interoperability Point 1 specifications for their respective net management systems.

The interfaces, which are expected to be available in the first half of next year, will provide links between BT's Concert and HP's OpenView and SunConnect's SunNet Manager, allowing Concert users to monitor and manage their LANs and BT-provided WAN services.

Through Concert, users can access a variety of information about their LANs, including data about faulty LAN segments, performance statistics and network capacity thresholds.

These capabilities are similar to what users can expect from the Microsoft-Infonet relationship. Infonet will integrate Microsoft's Hermes management technology into its own offerings to provide an end-to-end management service that extends to the desktop.

The products will provide information about the status of network equipment, inventory management, and performance and configuration management.

"These vendors are definitely heading in the right direction," said John McConnell, vice president of Infonetics Research, Inc., a consultancy in Boulder, Colo.

"Users are more concerned with seeing what's going on in the wide area and how it affects them than they are with actual management," he added. "As time goes on, you'll see more sophisticated management applications as users move to a more hands-on approach in the WAN." □

Navy sails LAN seas with air-blown fiber

NAVAIR launches net project that uses an FDDI backbone installed with air-blowing techniques.

By Ellen Messmer
Senior Correspondent

ARLINGTON, Va. — The Naval Air Systems Command (NAVAIR) this month began installing an extensive internet anchored by a Fiber Distributed Data Interface campus backbone that was set up using air-blown technology.

The NAVAIR Headquarters Network is being strung through 40 floors of seven buildings in Arlington's Crystal City area, linking dozens of local-area networks. T-1 lines installed last week to three remote Navy bases add support for more than 10,000 other LAN-attached users, creating what may be the single largest Apple Computer, Inc. AppleTalk network in the country.

Big undertaking

The FDDI backbone will be the largest in North America installed using air-blown fiber, according to NAVAIR and the vendors involved in the project. With air-blown fiber, dry nitrogen gas is

used to pump fiber-optic cable through air-tight tubing laid throughout a building. The technology will save the Navy about 30% in manpower costs as compared to manually stringing fiber, said Navy Commander Craig Luigart.

Luigart said T-1 lines installed last week tie Crystal City to bases in Lexington Park, Md., and Point Magu and China Lake, Calif. The Navy plans to add thousands more workstations to the internet after it awards a contract for a new network operating system this April.

The FDDI backbone will form the heart of the new net, which will carry NAVAIR administrative and engineering data. Ultimately, it will support X.500 Directory Services, X.400 electronic mail and file sharing at more than 30 locations globally supporting over 30,000 users.

The network is being installed with the help of Apple, Digital Equipment Corp., Electronic

(continued on page 22)

Fibronics announces new mgmt. application tool

By Skip MacAskill
Senior Writer

PEMBROKE, Mass. — Seeking to regain momentum after announcing a \$25 million loss for 1992, Fibronics International, Inc. last week rolled out a new application development tool that will help net managers integrate new equipment into networks.

The InterView/PowerMIB Development Toolkit is a set of software tools for Fibronics' InterView net management system that generates graphical management applications for Simple Network Management Protocol-based devices.

In order for new net devices to communicate with the network management system, a net manager must develop a management application for the device that allows that interaction — a process that requires a large amount of

software coding, which the manager must do manually.

The Fibronics tool kit reduces the time spent developing that application because it automatically builds the software code by compiling the device's SNMP data, including all Management Information Base (MIB) information. It also performs the testing and debugging functions and guides the manager through the entire process step-by-step, requiring only a basic level of network knowledge, according to Moshe Levin, company president.

"It can take several man-months to integrate complex SNMP devices, such as a network hub or bridge/router, into a network because of the complex code development that is required," he said. "By placing that development into the tool kit, (continued on page 22)

Navy sails LAN seas with air-blown fiber

continued from page 21

Data Systems Corp., Microsoft Corp., Sumitomo Electric Fiberoptic Corp. and Wang Laboratories, Inc. Federal Systems Division.

The Navy decided to use air-blown fiber for the FDDI backbone because of its long-term benefits, Luigart said. "Where you reap benefits is in reconfiguring the network in the future," he said. If a decision is made to change the plant from single-fiber

strand to six, or replace a broken strand, "you just blow the fiber out and put in a new one," he explained.

Peter Stout, project manager with Wang's Federal Systems Division in Bethesda, Md., said air-blown fiber is cost-effective when used in a campus environment. But analysts cautioned that the technology, while useful in certain instances, may not be the right choice everywhere.

Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J., said the traditional problem with fiber has been the

time-consuming process of pulling it through the conduit manually. While air-blown fiber was a good concept in terms of reducing the manpower required for the job, he pointed out that it has some trade-offs.

"You're buying into an idea here," Nolle explained. "Once you've put air-blown fiber in a conduit, you can't put in anything else."

Companies that would like to use conduit to run voice-grade wire along with the fiber strands would not be able to do that with air-blown fiber technology, he added.

"It's a special conduit with low internal friction and a small diameter," Nolle said. "The best use is where you have fairly long runs and the spaces are relatively inconvenient. Your fiber usage has to be very high."

The Navy's use of this technology is extensive. NAVAIR has installed 25,000 feet of tube conduit for the FDDI net. 3Com Corp. is providing its 3GH concentrators with NetBuilder 2 routers on each of the floors where the FDDI will run. "It all ties into the network management center in Crystal City," Luigart said. ■



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GTE

Firm announces management tool

continued from page 21

that integration is reduced to a few hours."

InterView/PowerMIB features a window generator that allows the net manager to create a variety of customized management windows for parameters such as physical layout and performance graphs. It also includes a certification application that will automatically test and debug a new device.

Additionally, the tool kit adds a MIB compiler that validates and incorporates SNMP MIB definitions contained within the

The process for integrating a device onto the net does not change when different vendors' equipment is involved.

▲▲▲

new device, automatically incorporating the information into InterView's MIB database for future reference.

A graphical subsystem is also included that allows net managers to build a graphical representation of the device, including all ports, LEDs and connectors. The tool kit uses a consistent user interface, so the process for integrating a device onto the net does not change when different vendors' equipment is involved.

InterView/PowerMIB will be available in July, with prices starting at \$15,000.

The tool kit release comes on the heels of the company's announcement that it lost more than \$25 million in 1992. Almost \$15 million of that figure was attributed to onetime expenses associated with the restructuring of the company, which included consolidating manufacturing plants and bringing in a new management team to help reshape the firm's market focus.

The company has been buoyed by the recent investment of an additional \$9 million by its parent company, Elron Electronic Industries, Ltd.

"Instead of going into companies and trying to sell a box here and there, we're now concentrating on providing the user with a complete network solution that includes design, layout, products and management," Levin said. "We have some work to do, but the pieces we need to turn things around are now in place." ■

Link Notes

continued from page 21

Ungermann-Bass, Inc. has reduced prices on its ASM1000 Fiber Distributed Data Interface concentrators and its complete line of FDDI adapters.

The four-, 10- and 16-port ASM1000s are now priced at \$7,995, \$17,995 and \$27,995, respectively. Single-attached FDDI adapters for SBus, Micro Channel Architecture, Industry Standard Architecture (ISA) and Extended ISA machines are priced at \$1,995, while the dual-attached versions now cost \$3,295.

NEC America, Inc. last week announced the formation of the Data Communications Systems Division, which will be responsible for the company's entire line of internetworking products, including bridges, routers, modems, communications servers and all packet-switching devices.

Compatible Systems Corp. last week rolled out software for its RI-SC-Router 3000E that it claims will allow the device to achieve the theoretical maximum throughput of 14,800 packet/sec when routing between Ethernet segments. The company will submit the router to an independent test laboratory to confirm that figure.

The software upgrade is free to existing users. The Ethernet-to-Ethernet router costs \$2,995.

North Hills has introduced the Mini-MAS, a 36-port work group hub that can support both 10Base-T Ethernet and token-ring end nodes, as well as a mix of cabling types such as shielded and unshielded twisted-pair wiring, coaxial cable and fiber-optic links.

The device, which supports the Simple Network Management Protocol, offers both in-band and out-of-band management capabilities.

Available in May, pricing for the Mini-MAS starts at \$4,320, depending on configuration.

Penril Datacomm Networks, Inc. has rolled out its Series 500 line of stackable 10Base-T Ethernet hubs.

The 510 model is an unmanaged device that supports 12 RJ-45 ports and costs \$995. The Slave SNMP 520, which also offers 12 RJ-45 ports, supports the Simple Network Management Protocol. It is priced at \$1,295. As many as four 520s can be cascaded to and managed by one 12-port Master SNMP 530, which is priced at \$1,795.

All of these models are available now.

In other news, the company announced IBM LAN Network Manager support for its Series 1200 bridge line and new software for its Series 2500 bridging hub that will allow transparent token ring-to-Ethernet and token ring-to-Fiber Distributed Data Interface bridging.

Networks Northwest, Inc. has announced a dial-up multiprotocol router that links Ethernets over analog telephone lines.

The two-port Breeze 1100 router supports an external 14K bit/sec V.32bis modem via an RS-232 port and comes

equipped with a 6-to-1 data compression technique that boosts effective throughput to 56K bit/sec. It also handles routing of Transmission Control Protocol/Internet Protocol and Novell, Inc.'s Internetwork Packet Exchange (IPX) traffic, as well as all bridging algorithms.

The Breeze 1100 costs \$2,650 and is available now.

Global Enterprise Services, Inc. (GES) has announced a new service that will enable users to dial into the Internet via a single analog line linked to a **Databi-**

lity, Inc. Mux/Router.

The Dialin' Gateway service provides Transmission Control Protocol/Internet Protocol connectivity to the Internet via standard telephone lines at speeds up to 38.4K bit/sec, eliminating the need for a leased line between the user's site and the nearest GES backbone node.

The service is available now in Philadelphia and New York, with expansion to other major locations scheduled throughout the year.

Cayman Systems, Inc. has boosted

the performance of its GatorShare AppleShare-to-Network File System gateway software with the newest release of the company's GatorBox EX Ethernet-to-Ethernet router — which now operates three times faster than GatorShare running on the vendor's GatorBox CS LocalTalk-to-Ethernet router.

GatorBox EX is priced at \$995.

Cayman also announced that it has cut the price on its GatorBox CS by \$1,000 to \$995. Finally, the vendor said it trimmed the price on its GatorLink multiport AppleTalk server from \$1,895 to \$1,445. **Z**

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Worth Noting

“A former New Jersey Bell telephone installer told us that he lost his job ‘because of all these newfangled services like Centrex and LSDN (sic).’”

Daniel Briere
President
TeleChoice, Inc.
Montclair, N.J.

Carrier Watch

In yet another effort to keep existing toll-free service customers in place as 800 portability looms near, AT&T last week launched a reward program under which users earn points redeemable for advanced 800 features, net management services, call center training and consulting services.

Under AT&T's Partners In Business Program, users with at least \$200 per month in AT&T 800-service domestic usage earn points that they can use to buy certain advanced features, add 800 numbers and routing arrangements, increase their 800-service usage or reach designated anniversaries of the program enrollment.

AT&T 800 users can earn additional points by signing up for an AT&T 800 Term Plan in which they commit to a minimum monthly usage for a specified period of time, usually ranging from 18 to 36 months. Customers also accrue points for ongoing usage under these term plans.

There is no fee for Partners In Business, but users must enroll in the program to earn points. The tariff for the program has been filed with the Federal Communications Commission and was to take effect March 27. ■

Bell Atlantic to extend SMDS availability in June

City	Monthly charge
Includes the cost of a T-1 subscriber network interface	
Baltimore	\$550
New Jersey's Delaware Valley	\$600
Norfolk, Va.	\$550
Richmond, Va.	\$550
Harrisburg, Pa.	\$600

The RBHC charges users a onetime \$1,000 installation fee per site.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: BELL ATLANTIC CORP., PHILADELPHIA

Bell Atlantic set to widen SMDS availability in region

Will charge flat monthly fee for unlimited usage.

By Bob Wallace
Senior Editor

PHILADELPHIA — Bell Atlantic Corp. last week detailed plans to offer Switched Multimegabit Data Service (SMDS) to users in Baltimore, Norfolk and Richmond, Va., and in New Jersey's Delaware Valley region starting in June.

Recognized by the industry as the most aggressive regional Bell holding company in terms of rolling out SMDS, Bell Atlantic already offers SMDS to firms here, and in Pittsburgh, northern New Jersey and Washington, D.C.

SMDS is a high-speed, packet-oriented, digital data service that supports transmission at 1.17M bit/sec using a T-1 access link. Local carriers have positioned it as an interenterprise service to support numerous applications.

“We’re not looking to replace point-to-point T-1 lines,” said Mara Spaulder, manager of broadband and wide-area network product development for Bell Atlantic. “We’re trying to connect customers with many sites within a city.”

Bell Atlantic will charge users a flat monthly fee for unlimited SMDS use and the subscriber network interface (SNI), which is a T-1 access line, as well as a one-time installation charge per site.

The company will charge firms in Baltimore, Norfolk and Richmond \$550 a month and a \$1,000 onetime installation fee, while users in the Delaware Valley area will pay \$600 a month and a \$1,000 onetime installation charge.

The RBHC tentatively plans to

offer SMDS to users in Harrisburg, Pa., in the third quarter of this year for \$600 a month and the \$1,000 onetime installation charge, Spaulder said.

Bell Atlantic is using Siemens Stromberg-Carlson's EWSM MAN Switch, a cell relay switching platform, to deliver SMDS service to users in each of the cities. The switches will be upgraded to support 34M bit/sec of throughput

“We’re not looking to replace point-to-point T-1 lines. We’re trying to connect customers with many sites within a city.”

▲▲▲

on a 45M bit/sec SNI. With both speeds, a sizable amount of bandwidth is used for overhead.

Bell Atlantic has also been allying with firms that make customer premises equipment that works with SMDS.

The RBHC announced at the INTEROP 93 Spring conference that it has begun reselling SMDS-compliant data service units/channel service units and adapters made by ADC Kentrox of Portland, Ore., Digital Link Corp., of Sunnyvale, Calif., MultiAccess Computing Corp., of Santa Barbara, Calif., and Verilink Corp., of San Jose, Calif. ■

AT&T rolls out new transaction service

InterSpan Transaction Access Service geared toward users that have point-of-sale applications.

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — Following Sprint Corp.'s lead, AT&T last week said it will offer a new transaction processing service to support point-of-sale applications used by retailers, banks and credit card companies.

The service, dubbed InterSpan Transaction Access Service, will link POS devices at retail outlets to host processors at transaction processing companies. It will be supported by AT&T's Accunet packet network and front-end controllers from Hypercom, Inc. that run special transaction processing software.

The AT&T announcement comes just weeks after Sprint detailed plans to build a dedicated network, called TranXact, to support a new family of transaction processing services (“Sprint offers dedicated net for transaction

processing,” NW, Feb. 22).

AT&T already offers transaction processing services that use 800 numbers, but the new service has speed and host processing time enhancements, said Ed Traub, InterSpan Transaction Access Service product manager for AT&T. “We figure that we can reduce the time per transaction from 15 to 17 seconds using 800 service to under 10 seconds with our new service,” he said.

By comparison, Sprint said its transaction processing service will support response times between 10 and 12 seconds.

When using 800 services for transaction processing applications, the local carrier must perform a lookup to determine the terminating location and carrier, which takes time.

Users have several options other than 800 lines for accessing (continued on page 26)

FCC net reliability group prepares to close up shop

WASHINGTON, D.C. — The FCC advisory group charged with improving network reliability is on the verge of disbanding, even though a new government report indicates network outages are a more serious problem than previously acknowledged.

Several members of the Network Reliability Council (NRC), a group created last year to advise the Federal Communications Commission on ways to improve net reliability, said at a recent meeting they believe they have made significant progress and are prepared to dismantle the group. Meanwhile, a General Accounting Office (GAO) report issued two weeks ago said the level of carrier outages far exceeds previous FCC estimates.

In June, the NRC will hold a symposium at which it plans to unveil seven reports focusing on ways to improve security of everything from hardware and software to power systems. The group has one meeting in April

before that symposium, and several members, including AT&T, MCI Communications Corp. and Sprint Corp., want to discontinue the group's quarterly meetings after that date.

“April 14 may be our self-destruct date,” said Paul Henson, chairman of the NRC.

Steve Hewlett, the NRC representative for the National Regulatory Utility Commissioners, said the group should be disbanded this year. “The FCC is the appropriate body to monitor whether parties implement the [NRC] recommendations, and it's superfluous for us to continue this group beyond the symposium,” he said.

The effort to disband the NRC is not unanimously supported. Ron Binz, who represents the National Association of State Consumer Advocates on the NRC, said he opposes disbanding the group. Because many of the recommendations for better technical and administrative processes (continued on page 26)

Group prepares to close up shop

continued from page 25

will take time to implement, the NRC has an ongoing monitoring role, he noted.

Before the NRC can disband, it must convince the FCC that it has largely completed its mission of devising ways to make the public net safer. That decision will be made by Cheryl Tritt, chief of the FCC's Common Carrier Bureau.

The FCC declined to comment beyond a brief statement it issued about the prob-

lems pinpointed in the GAO report on network outages. "The GAO study of telephone service outages will provide valuable additional information on the number and causes of such events," the statement said.

It was unclear how the GAO report might affect the FCC's decision on whether to continue the NRC. The report indicates that in 1990 and 1991, there were 1,000 outages lasting an average of three hours and affecting more than 69 million customers. That is far higher than the 121 outages affecting 47.6 million people that the

FCC reported for the same period, but the reports are based on different criteria.

The GAO, in seeking to provide a more generalized picture of outages as opposed to just the most catastrophic problems, looked at all outages affecting 10,000 customers for at least 15 minutes. The FCC requires carriers to report all outages affecting 50,000 or more lines for more than 30 minutes.

Nonetheless, the GAO report seems to bear out concerns users have expressed about the FCC's outage reporting system. Groups such as the Tele-Communications

Association, Inc. have repeatedly pressed the agency to broaden the scope of outage reporting to include at least outages affecting 30,000 lines.

Rep. Edward Markey (D-Mass.) said he was disturbed by the number of outages listed in the report. "This report should focus the attention of the industry and the FCC on the need for concrete steps to improve network reliability and quality," he said.

However, Henson downplayed the significance of the GAO report. "[Carriers] didn't have a very good record in 1990 and 1991, and its only recently that most of us have stepped up to the plate [to improve reliability]," he said. "There's nothing I see in the report that indicates we're going backward." ■

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By MOTOROLA

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AT&T rolls out new transaction service

continued from page 25

the AT&T service, including dial-up access via a local exchange carrier or an AT&T-provided 950 number and point-to-point or multipoint private lines.

AT&T said the design of its network also helps streamline transaction processing to save users money, as well as reduce the computing requirements on the host.

AT&T shifted the task of polling POS devices from the host to a device called the

AT&T said the design of its network also helps streamline transaction processing to save users money.



Network Interface Processor (NIP). The NIPs were built by AT&T and Hypercom, and installed on the periphery of the net.

Wells Fargo & Co., California's second largest bank and a user of the service, said it has reduced its transaction processing time from about 20 seconds to roughly 10 to 12 seconds. National Data Corp., an Atlanta credit card authorization firm for oil companies, said it has used the offering to cut transaction time from between 13 and 18 seconds to 5 and 10 seconds.

The NIP supports multiple protocols, including VISA I, VISA II and Synchronous Data Link Control.

"We can also cut down the number of CPU cycles on the [user's] host," Traub said. This is done by off-loading communications information processing from the host to the NIPs, which work with POS devices to set up and tear down calls.

AT&T technicians will monitor the net supporting the service from a dedicated Network Management Center, giving customers a single point of contact for service provisioning and maintenance. Custom reports and billing will be available.

InterSpan Transaction Access Service is currently being deployed as part of a controlled introduction and will be generally available next month. It will be sold under customer-specific contracts. ■

ENTERPRISE APPLICATIONS

CLIENT/SERVER AND ENABLING SOFTWARE: DISTRIBUTED DATABASE, MESSAGING, GROUPWARE AND IMAGING

Worth Noting

“Two years ago, our research concluded that client/server systems cost 15% to 20% more to build than time-sharing [systems]. Since then, plummeting hardware prices and better development tools have narrowed the gap and essentially justified the move to client/server.”

Neil Hill
Senior analyst of computing
strategy research
Forrester Research, Inc.
Cambridge, Mass.

Store & Forward

Irvine, Calif.'s **International Computers, Ltd. (ICL)** has announced Version 200 of Access Manager, client/server software that enables users to log on once to access net-based applications on multiple platforms. The software, which allows systems administrators to maintain network security from a single workstation, runs on Microsoft Corp. Windows, as well as terminal-based clients and ICL's Unix servers. It costs between \$200 and \$295 per user.

Also, ICL is demonstrating Dialogue Manager, an application development tool that provides a common front end to multiple transaction processing systems, including Unix System Laboratories, Inc.'s Tuxedo, IBM's CICS and ICL's Transaction Processing Management System. It supports Windows, the X Window System and Digital Equipment Corp. VT-220 terminal client environments. ■

Vendors to fuse imaging, work flow technologies

MailMan, WorkMan to ship with Imagery pack.

By Bob Brown
Senior Editor

Imagery Software, Inc. and Reach Software Corp. last week announced a licensing agreement under which Imagery's imaging technology will be incorporated into Reach's work flow and electronic mail products.

The combination will enable users to capture, display and manipulate data images within E-mail or work flow applications. Work flow applications, for example, could include insurance claims processing applications that integrate paper-based images of claim reports along with adjusters' photographs.

“Imaging adds the next level of content — beyond spreadsheets and word processing — to work flow applications,” said Anand Jagannathan, president of Reach, which is based in Sunnyvale, Calif.

Reach sells the MailMan E-mail client software and WorkMan work flow software, which began shipping this month.

Imagery, a Bedford, Mass., subsidiary of Eastman Kodak Co. that sells document imaging software, recently announced it would be working with Novell,

Inc. to build an image-enabled version of NetWare.

Under the Imagery-Reach agreement, a copy of Imagery's client software will be included with each copy of Reach's MailMan and WorkMan software at no extra cost, said David Hanson, vice president of business development at Imagery. The firms hope to complete the integration effort by May, he said.

Kim Peyser, chief operating officer at Reach, said the imaging technology will be included in the second version of WorkMan, which the company expects to unveil in the fall.

Other additions

Reach will also offer add-on software products from Imagery for shared image scanning and optical character recognition capabilities.

Imagery will assist Reach in supporting Novell's Image Enabled NetWare platform, which will be available later this year. The server-based imaging system will enable users to perform document management functions, while the client software will be limited to viewing and sending images. ■

DataBeam software gets everyone in on graphics

By Joanne Cummings
Senior Writer

LEXINGTON, Ky. — DataBeam Corp. has unveiled software that lets as many as 16 users interactively share and edit graphics and other documents over local-area networks or dial-up wide-area network links.

The software, called FarSite, is intended to enable users to view and make changes in real time to complex files, such as computer-aided design and manufacturing drawings, without having to travel, the company said.

FarSite runs on Sun Microsystems, Inc. SPARCstations, and a version for Microsoft Corp. Windows-based personal computers should be available by year end. The product works with any PostScript-compatible application.

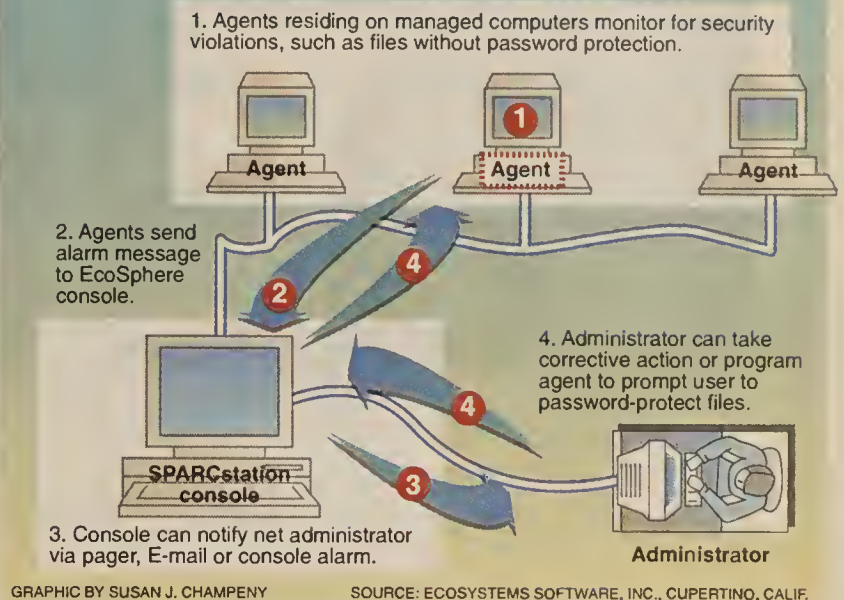
To share a graphic or document, customers must first enter the information into FarSite by printing it as a PostScript file using FarSite's virtual printer capability, which is triggered by clicking on a menu item within the application.

The user can then send the file by clicking on a variety of user destinations, which are listed in the FarSite telephone book. The phone book menu is configured by the administrator, who defines the best method for linking with selected users. In addition, each destination can have multiple connection options, enabling the software to choose the best connection according to the time of day and other administrator-defined parameters.

(continued on page 30)

Software helps manage client/server apps

New version adds security features.



EcoSystems bolsters client/server tools

Adds support for Oracle 7 database, interface for accessing SNMP agents to new EcoTools version.

By Joanne Cummings
Senior Writer

CUPERTINO, Calif. — EcoSystems Software, Inc. has announced a new version of a tool set used to build software agents for managing computers, networks and distributed relational database management systems in client/server Unix environments.

New features in EcoTools Version 1.1 include support for Oracle Corp.'s Oracle Version 7 relational database and an interface that enables the tools to access information from Simple Network Management Protocol agents.

The previous version supported Oracle Version 6 and remote procedure call-based management system agents (“New software targets client/server mgmt.,” *NW*, July 6, 1992).

EcoTools enables users to customize software agents, which run on a variety of networked computers. The agents communicate with the firm's EcoSphere management software, which runs on a Sun Microsystems, Inc. SPARCstation, allowing users to manage agent-resident computers, the networks linking them and the relational DBMSs residing on them.

By communicating with the agents, EcoSphere can display information about the applications

and databases that reside on each client and server in the network, and detail which clients are working with which servers. It can also chart resource utilization to determine whether devices are overloaded or creating errors, or whether attached printers are down.

It correlates performance, fault and configuration data to

EcoSphere can chart resource utilization to determine whether devices are overloaded.

▲▲▲

determine, for example, whether a system slowdown is caused by a network bottleneck, an application hogging resources or a database overloaded by data requests.

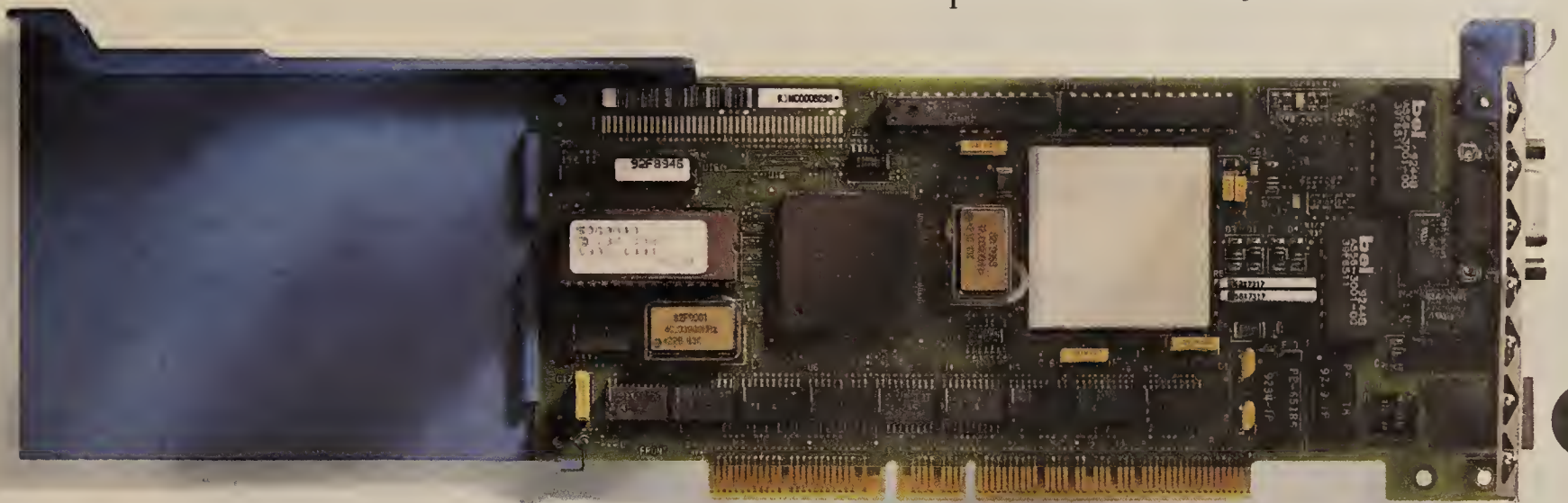
Version 1.1 provides a variety of new features, including the expanded database and SNMP support.

“The new database support is important,” said Gary Falsken, database administrator for XES, Inc., a division of Xerox Corp. in San Jose, Calif., that has been us-

(continued on page 30)

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IBM

EcoSystems bolsters client/server tools

continued from page 27

ing a beta version of the software. "We needed support for both [Oracle] 6 and 7. And we had been crying to them for the SNMP support."

Falsken said the SNMP feature enables EcoSystems software to communicate with the company's SunNet Manager network management system.

"EcoSystems doesn't yet have the capability to know when a new device has been

added to the network [because it does not perform continuous network discovery functions]," he said. "We still need SunNet Manager for things like that, and this is a way for them to coexist."

Version 1.1 also offers new security features that enable users to configure agents to inform EcoSphere when certain users log on or when a specified number of unsuccessful logons have been attempted (see graphic, page 27).

Like previous version, users can configure agents to notify a systems administrator via electronic mail, a pager or by trip-

ping an alarm on the EcoSphere console.

Users can also prompt agents to take a certain action when an event occurs. For example, when an agent detects that a particular user's files or system directories are not password-protected, it can prompt the user to password-protect the information.

In addition, the new version has improved console management, enabling EcoSphere to retrieve and act on systems messages originating from an operating system kernel, peripheral device or application. The tools now enable users, for ex-

ample, to configure an agent to monitor a printer for messages concerning an overloaded print queue. Another tool enables users to build agents that monitor critical job processes, such as data backups and archiving.

The new version additionally offers support for Network File System (NFS) servers, enabling agents to run on NFS servers and monitor the servers and server-resident databases.

Future versions of the software — due in the second half of the year — will support relational DBMSs from Sybase, Inc. and Informix Software, Inc., as well as OS/2 and Novell, Inc. NetWare environments, said Ching-Fa Hwang, vice president of development at EcoSystems. Hwang also said a version supporting manager-to-manager communications should be available by year end.

EcoTools Version 1.1. will be available this week and is priced the same as the previous version, beginning at \$16,000, for a release supporting one database server and 16 concurrent users. ■

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Databeam gets everyone on graphics

continued from page 27

The software can work over any Transmission Control Protocol/Internet Protocol-based network or over dial-up telephone lines.

When used with dial-up links, the company recommends using at least 9.6K bit/sec modems but said a typical file can be transferred over a 2,400 bit/sec line in about 60 seconds.

Once a file has been transmitted, the software notifies the participants in the meeting, and the group can begin real-time editing of the document. FarSite uses compression techniques to transmit only the changes made to the document, en-

Users separated by large distances can use the company's Meeting Manager to reduce costs.



abling users to manipulate and edit the document in real time.

Users separated by large distances can use the company's Meeting Manager to reduce costs.

A Meeting Manager in Boston, for example, can forward a graphics file to another Meeting Manager in London. The receiving unit then copies the file to users in London, saving them the expense of having to run WAN links to each remote user.

Users linked in a session can manipulate and edit files in real time using a variety of scrolling and colored pen-type tools. Once the file has been edited by the group, the entire transaction can be saved to each workstation's hard disk for later review, the firm said.

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

Worth Noting

“The whole endgame [in Europe] is for this: to have the telecom [carriers] behave more like businesses rather than roadblock monopolies.”

Derek Nicholas
Chairman
International Telecommunications
Users Group

Documents show NCR may lose rights to IBM's NCP

Would have major effect on NCR's FEP business.

By Michael Cooney
Senior Editor

ST. PAUL, Minn. — NCR Corp.'s Network Products Division last week said it will continue to build and enhance its IBM-compatible 56XX front-end processors (FEP), despite information indicating that the company will soon lose the rights to use key IBM FEP technology.

According to documents obtained by *Network World*, NCR signed a license agreement with IBM in 1985 that allowed NCR to use IBM's Network Control Program (NCP), the core of all FEP software. But that agreement apparently will expire on July 31, leaving NCR without the rights to use the technology and making it difficult for the firm to keep up with IBM in enhancing its FEP line.

The documents show that NCR paid IBM \$10 million plus royalties for the rights to use NCP and incorporate its features in NCR's 56XX family. They indicate that NCR will have rights to IBM's NCP Version 6.1, which runs on the IBM 3745 FEP line, but no releases beyond that.

If the agreement does expire in July, it is unclear why NCR would not have rights to IBM's NCP Version 6.2, scheduled to become available in June. What is clear is that without the NCP format and protocol specifications from IBM, NCR would not be able to enhance its 56XX line without extensive reverse engineering.

Neither IBM nor NCR would comment except to say that the contract exists.

The firm said it has not elected to stop providing IBM-compatible PU 4 systems. “We will provide functionality beyond NCP 6.1,” said Susan Babich, director of product planning for NCR's Network Products Division.

Analysts familiar with the IBM-NCR contract said that even if NCR loses NCP rights and despite the decline in the FEP business, NCR will likely continue marketing FEPs.

“NCR hasn't been very vocal in the marketplace for a couple of years now, and they've let some product ship dates slip,” said one analyst who requested anonymity. “They haven't helped themselves very much, but I can't see them leaving the market.”

Currently, NCR ranks a distant second to IBM in installed 3745 machines. According to market researchers at Computer Intelligence, IBM has about 17,000 FEPs in the U.S., while NCR has 3,500 and Amdahl Corp. has 1,500.

Babich acknowledged the market decline but said the company wants to “help users migrate from SNA to TCP/IP.”

The company said users can expect to see a flurry of announcements in the next few months, including introduction of an IBM 3172-compatible device as well as NCP 6.1 for its 56XX FEPs. □



David Fowler



Roger Dev

Net mgmt. challenges call for cooperation

Vendors and users both agree that much work remains to be done, but the job is not impossible.

By Skip MacAskill
Senior Writer

It's the economy, stupid.

While that was Bill Clinton's touchstone during his successful run for the presidency last November, the phrase is no less appropriate as a rallying cry for net managers whose shrinking budgets are putting a strain on their ability to do their jobs.

Forced to contend with growing networks and shrinking staffs, net executives now, more than ever, need sophisticated, proactive network management systems that can help keep businesses running smoothly. Yet many net management offerings look pretty but fall short of being effective tools.

So what's the answer?

When leading users and inter-networking vendors were brought together recently at a network management roundtable sponsored by *Network World*, the unmistakable conclusion was that the industry needs to view net management in more of a business light than a technological one.

“Until very recently, network management did not exist,” said John McConnell, vice president of Infonetics Research, Inc., a consultancy in Boulder, Colo. “What we had was fancy network monitoring with bells, whistles and colorful icons. Users need management applications that will help them run their businesses by reducing labor costs, increasing productivity and keeping mission-critical functions up and running.”

Gus Coronel, senior network engineer and local-area network administrator for the U.S. De-

partment of Transportation, agreed.

“Network management is not a little light that starts blinking when your network is ready to go down,” he explained. “Sadly, that's more of what we're seeing from vendors.”

Because businesses are increasingly relying on their networks to support more mission-critical applications in addition to day-to-day communications and word processing functions, users are looking for tools that will actually help them manage the process of managing the network.

“Technologies that support the business goals of the organization must be put into the management systems,” McConnell said. “Let's say you have two lines leaving corporate headquarters, for example, and one fails. It's easy to keep the other line really busy, but how do you make sure that the traffic needed to keep the business running gets the resources and the things that are low priority are either suspended or slowed down? No [vendor] is tackling that.”

And that piece of the management pie becomes even more essential when the net manager is facing an ever-growing network with an ever-shrinking staff.

“I need anything that will prevent my network from self-destructing for the next three years,” said John Scoggin, supervisor of network operations at Delmarva Power & Light Co. in Newark, Del. “I say that and laugh, but that alone could make or break the way the company does business.”

Scoggin's frustration is not
(continued on page 36)

People & Positions

Gilbert Williamson, chairman and chief executive officer of NCR Corp., will retire May 1. He will be succeeded by **Jerre Stead**, currently president of AT&T Global Business Communications Systems.

Donald Heath, formerly vice president of data marketing at MCI Communications Corp., has joined BT North America, Inc. as vice president of product management and marketing.

Heath will oversee BT North America's marketing strategies and will have management authority for Syncordia Corp.'s marketing activities. He will report to **Gerald Thames**, president and chief executive officer of BT North America and Syncordia.

Moshe Levin, formerly general manager of the Fibronics America group and vice president of marketing and business development for Fibronics' worldwide operations, has assumed the position of president at Fibronics America.

Levin will oversee all sales, marketing and service efforts in the U.S., Canada and Latin America. He reports to **Gil Weiser**, president and chief executive officer of Fibronics International, Inc. □

INDUSTRY BRIEFS

IDB has record revenues and earnings. IDB Communications Group, Inc., a Los Angeles-based international carrier, reported 1992 revenues of \$155.3 million, up 49% from the \$104 million recorded in 1991. Net income for the period rose from \$1.5 million to \$8.5 million. The company said the growth stemmed from market expansion and acquisitions, which included WorldCom, Inc. The company recently announced its intention to purchase another international carrier, TRT Communications, Inc.

Open systems groups establish open connection. Open systems consortium X/Open Company, Ltd. and the European user group OSITOP have formally established an alliance to cooperate on activities, including standards-making efforts such as X/Open application program interfaces. □

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Challenges call for cooperation

continued from page 33

uncommon. According to a recent Infonetics study, network growth has been explosive, with a 50% gain in the number of end nodes, 150% growth in the number of LANs and a 140% increase in the number of interconnection devices — such as hubs and bridge/routers — on the net.

However, the growth in information systems staff to manage all that new gear has only been between 5% and 10%.

"That disparity may be the major driver in igniting the development of better management tools since there appears to be no other alternative to keep up with these burgeoning networks," McConnell said.

According to vendors, for those tools to be effective, users need to change their thinking about how network management is positioned within the organization.

"In the majority of companies, running the network is considered an overhead function of running the business, and the mentality is to squeeze out as much overhead as possible," said Roger Dev, director of software development at Cabletron Sys-

tems, Inc. "That thinking must be reversed, so the net is treated as a tool and not a liability."

In order to turn network management systems into tools and help managers deal with smaller staffs, vendors will have to embed more intelligence into products and distribute the management functionality across the entire network.

"Embedding the intelligence inside the network fabric is very important and should be a continuing focus this year," said Asheem Chandna, director of network management strategic marketing at SynOptic Communications, Inc. "You have a trend to push more intelligence into the network to make it almost self-managing at several points, which will also reduce the effects of network failures. You won't have all your eggs in one basket."

A second change that has to occur is the transfer of wide-area

network management thinking to the LAN world, according to David Fowler, vice president of marketing for Chipcom Corp.

"The reason users are comfortable with the self-healing aspects of their T-1 and other wide-area nets is because the telecommunications market has proven itself to be incredibly reliable over the last 25 years," Fowler said. "Our mindset as an industry has always been that because the net is within a building, it has to be treated differently. We have to treat the LANs the same way we've been treating the WANs."

Dev said the technology on the LAN side must mature before the transition can occur — and that could take years.

"You can't have mature management when technology is changing every other day," he explained. "We have to acknowledge that this whole LAN industry is in its infancy right now. Once the technologies settle in and become more familiar, users will

have more confidence in them."

Once the WAN mentality has been adopted in the LAN environment, it follows that management of the two worlds will probably be brought together.

"One of the key issues over the next few years will be the convergence of LAN and WAN management knowledge," said Chandna. "The question then becomes who's responsible for packaging that up for the user."

The ultimate WAN-to-LAN answer, according to Didier Moretti, general manager of Ungermann-Bass, Inc.'s Network Management unit, may be Asynchronous Transfer Mode (ATM).

"We've talked about ATM and the hype associated with it, but ATM clearly has a role to play," he said. "Deployment of ATM will be a gradual thing, but the biggest promise of the technology is in the net management area in terms of simplifying networking, providing on-demand bandwidth and focusing on the logical layer of management. As vendors, we need to focus on bringing some of the benefits of ATM to the current infrastructure so users can get comfortable with it."

The vendors also stressed the need to provide users with comprehensive service and support

so net managers can concentrate on long-term net planning and their company's business goals.

"There are a lot of network managers who are struggling out there and finding it increasingly difficult to manage their nets by themselves," Chandna said. "Network management service and support will be a big thing this year for a majority of users."

For leading-edge, hands-on users like Coronel and Scoggin, however, it is more an issue of getting better documentation and timely information from the vendors.

"I don't want someone to come in, fix my problem and then go away without telling me what he did," Coronel said. "I would much rather they sent me the documentation I needed that explained how X, Y and Z works so I could handle the problem myself."

Scoggin agreed that the vendors have to do a better job of supplying information.

"Instead of receiving 30 different CDROMs with information that is at least 90 days old from 30 different vendors, I'd like to see those knowledge bases in the same format [and] on-line on a WAN that is universally accessible," he said. **■**



John McConnell

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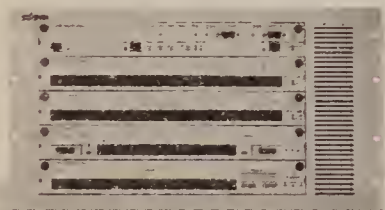
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LinkBuilder Focus

HP, IBM to buttress DME

continued from page 15

tems, Inc. and Groupe Bull SA in assisting OSF with integrating the network management piece of the DME framework, she said.

The spokeswoman said OSF realized that it needed to buttress the DME integration work with IBM's and HP's participation to get DME to market faster.

"We've remained very sensitive to people's reactions to when applications were going to be out there," she said.

Other players indicated that IBM and HP will help make the Tivoli component of the DME compliant with the Common Object Request Broker Architecture (CORBA) from the Object Management Group, and then make DME compatible with IBM's and HP's object-oriented computing models.

"HP and IBM are interested in making sure that the DME will fit compatibly with their generalized object models [and become] CORBA-compliant," said Frank Moss, president of Tivoli.

CORBA is a specification for an object request broker, which shuttles requests for services between applications and the ob-

jects that supply those services.

Jeff Thiemann, HP's OpenView program manager, would not comment on the upcoming announcement. But he confirmed that HP and IBM are looking to make DME more compatible with their object models through CORBA.

"HP would view it as a negative to see DME or even pieces of DME fail," Thiemann said. "That's clearly not in our best interest."

▲▲▲

"What we want to roll out is a distributed object computing infrastructure that includes manageability," Thiemann said. "That's all based on the CORBA specs. That is a hot topic for discussion between IBM, HP, Tivoli and OSF."

Ray Williams, a senior technical staff member for IBM Networking Systems, declined to

comment, deflecting questions back to OSF. Siemens Nixdorf spokespeople were said to be traveling and unavailable for comment.

IBM's and HP's expanded role in the DME effort comes as the vendors ally with Sun Microsystems, Inc., Novell, Inc. and others to deliver a common Unix-based operating environment. That initiative includes work to rationalize and accelerate the acceptance of industry specifications for systems management ("Top rivals unite to build a better Unix, thwart NT," *NW*, March 22).

Speculation arose that the group was out to define yet another framework for systems management akin to the OSF's DME. A market research firm even circulated a bulletin stating that IBM and HP wanted to replace the Tivoli component of the DME.

HP, OSF and Tivoli quickly dispelled such a notion. "HP would view it as a negative to see OSF or DME or even pieces of DME fail," Thiemann said. "That's clearly not in our best interest."

Moss agreed. "The Tivoli Management Environment will remain the core of the systems management offering of DME," he said. ■

McData 7100s get update

continued from page 15

support that capability in a future release.

No additional software is required for McData 7100s shipped with Level 3.1 or above operating system software. The 7100's current program release is 3.2. Both levels of system software enable the 7100 to communicate with PU 2.1 devices and support LU 6.2 sessions.

CSCM is a follow-on product to McData's existing Central Site Customization (CSC) PC-based configuration program. CSC lets users keep 7100 controller information in a central location but did not have electronic software distribution capabilities.

"CSCM makes network management easier and eliminates the cost and duplicated efforts of having configuration experts at each remote site," Card said.

CSCM is also less costly and easier to use than IBM's NetView DM, which resides on the mainframe and distributes various types of software to IBM's 3174 controllers and OS/2-based PCs. It ranges in price from about \$40,000 to over \$100,000, depending on processor size. Ad-

vanced CSCM is available for \$2,950.

Users can manage their entire network of 7100s from one CSCM PC or manage segments of their net with two or more CSCM PCs, Card said. "Whatever the user chooses to do, it's still a significantly less expensive alternative to NetView DM."

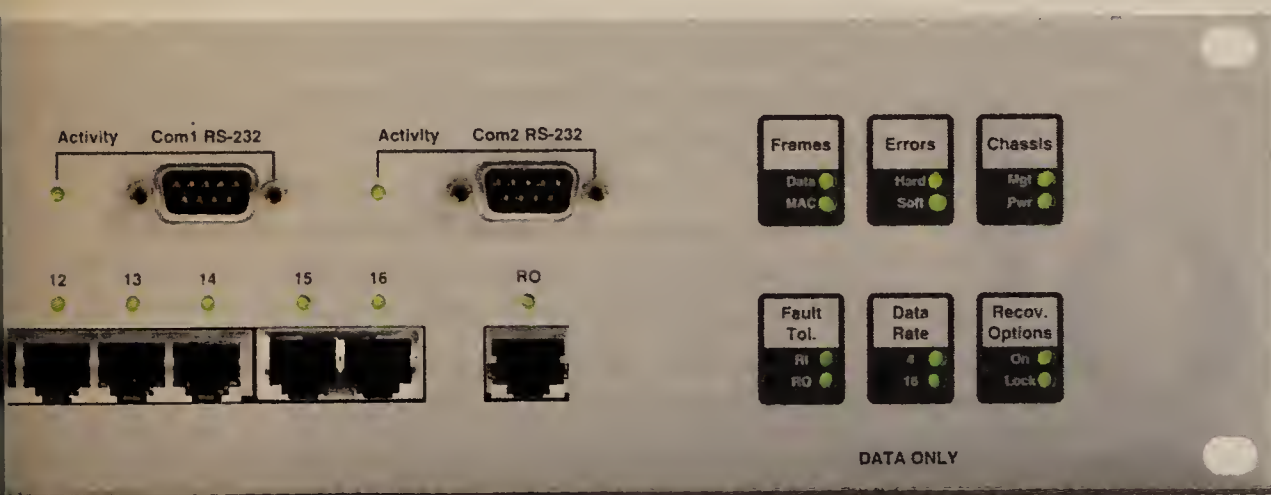
Beta users have given CSCM good reviews so far.

"We have a staff of three people to watch over 900 SNA devices distributed throughout the city," said Lorenzo Washington, assistant director of telecommunications at Howard University in Washington, D.C. "CSCM lets us take care of the controllers from a central site without having to have someone physically at the controller site."

Jerry Pilakowski, a senior telecommunications specialist with Union Pacific in Omaha, Neb., said CSCM lets him more efficiently handle his 7100s, which are spread across many states.

"Whenever we wanted to get a new software release to each site, we mailed a diskette to them, but we had no idea whether or not they actually loaded each release," Pilakowski said. "With CSCM, we can ensure everyone is at the same level of software." ■

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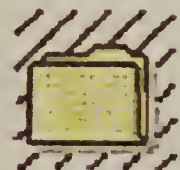
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Worth Noting

When planning for disaster recovery, "a user must take the probability of losing data and multiply that by the cost per amount of downtime. For financial institutions that move billions of dollars around every day, it's easy to make a business case to cost-justify a recovery plan."

Todd Dagres
Vice president of
data communications
The Yankee Group
Boston

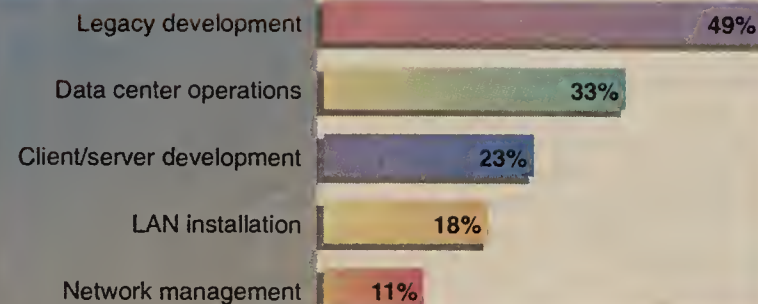
Manager Minutes

Network World is cosponsoring DB/Expo '93, a conference focusing on databases, client/server applications and information technology scheduled for May 3-7 in San Francisco.

DB/Expo '93 will feature a variety of in-depth seminars, including "Evaluating and Using SQL Client/Server Software," "Object-Oriented Database Systems" and "Developing Client/Server and Cooperative Processing Applications." In addition, the conference will feature different conference tracks focusing on specific areas of client/server and database technology, such as client/server applications development, client/server and data warehousing, desktop database, object-oriented and evolving technologies, and executive DB/Expo.

The fee for attending all conference events is \$1,495. For more information, call (800) 232-3976. ■

What is your company outsourcing?



Almost half of the 50 users surveyed from large U.S. companies are outsourcing legacy application development, often in an effort to help them concentrate in-house development on "new world" technologies such as client/server applications.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

Firms offer recovery tips following WTC bombing

Cleaning advice, planning diskette made available.

By Joanne Cummings
Senior Writer

NEW YORK — In the wake of the World Trade Center bombing here, several vendors are offering free advice on how to recover data from damaged computer and network equipment, as well as help in building a comprehensive plan to stave off future disasters.

One such firm, OnTrack Data Recovery, Inc., is offering tips to users looking to recover data from smoke- and fire-damaged disk drives, as well as discounted recovery services for World Trade Center users. Another firm, Contingency Strategy Associates, Inc. (CSA), is issuing a free diskette that walks managers through the task of building and justifying disaster recovery plans.

OnTrack suggested several caveats to users looking to recover data from network servers or local-area network storage media.

First, do not attempt to operate a drive if it is visibly damaged or has been exposed to smoke.

"Data platters exposed to soot and moisture particles may be irreversibly damaged if not recovered in an air- and static-controlled clean room," explained Stuart Hanley, engineering manager at the firm.

Hanley also advised users not to utilize diskettes or tapes that have been exposed to smoke or moisture without first cleaning them properly.

He also cautioned against the use of simple software utilities to recover data from smoke-damaged disks and said users should not shake or remove the cover on

the hard drive assembly.

"That could void the drive manufacturer's warranty and aggravate the already fragile condition of the platters," he said. "The drive casing should only be opened in the controlled environment of a clean room."

The company has established a hot line for World Trade Center users. For more advice, call (800) 872-2599.

CSA's free diskette is aimed at helping network managers formulate a comprehensive plan for recovering from World Trade Center-like disasters.

The IBM Personal Computer DOS-based diskette contains a presentation called "Why a Disaster Recovery Plan Makes Good Business Sense," which guides managers through the initial steps for building a cohesive recovery plan and its cost-justification.

"Most network managers are hard-pressed to find the time to develop a recovery project proposal — complete with financial information — to gain their management's support," said Caroline McFarland, president of CSA. "[The diskette] will assist in this stage of the project by outlining the major project elements and associated costs."

The cost elements for preparing, testing and maintaining a plan are provided in the presentation, along with a comparison of several planning products and services.

The diskette requires an IBM PC configured with at least DOS 2.0 and a 5.25-in. drive.

To order, call (203) 674-1855. ■

NETWORKING PEOPLE

BY FRANK SCHOFF

Job picture brightens for net professionals

The job market for networking and information technology professionals is definitely improving, and today's net managers should be prepared to take swift advantage.

Because the economy is still recovering, most network professionals are wary of positive signs in the job market. Although the weak economy played a part in the poor job market, the recent corporate downsizing would probably have occurred anyway.

Corporations that have downsized are doing quite well, which may indicate that staff reductions were appropriate and perhaps overdue. Many technology professionals' skills were tied more to the past than to the future, and many firms used the downsizing process to clean house of those obsolete skills.

At the same time, many organizations delayed hiring while they assessed technology changes — such as mainframe vs. distributed computing — and the impact those changes would have on staffing and organizational structures.

But now the companies that have remained healthy but conservative during the recent economic downturn seem ready to invest again in the future.

For job seekers, this is good news, particularly for those who have been unemployed as the result of downsizing. And for those who have remained employed but put career advancement on hold, this may be the time to dust off their resume.

An improving job market, however, does not guarantee a new job. The management positions that disappeared during downsizing over the past two years are unlikely to reappear because of an improved economy — corporate America has

found that it can run with fewer management layers.

The improved job market will bring mixed blessings for the hiring manager. The ability to hire new employees will bring welcome relief to those who had to reduce staff while the work loads remained constant or even increased. Also, the added staff will get new and shelved projects moving.

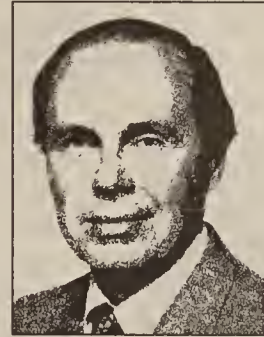
However, there will be some new problems. Managers will have to carve out time from already busy schedules to define new jobs and organizational structures, as well as to interview and hire. Those who delay the hiring process will see their top candidates snatched up by more aggressive managers.

In the first two months of this year, I have seen my clients lose four of their top candidates because of interviewing delays. Six months ago, that would not have happened.

And don't forget those employees who put their careers on hold until the job market improves. Their antennae will be going up — the ads will be running, the recruiters will be calling, and the personal networks will be humming.

This is a good time to ensure that your important employees know that you value their work. Make sure your salary schedules keep pace with the marketplace. And be sure to communicate good news about your company when it is available; people have heard too much bad news during the past two years. ■

Schoff is president of Management Recruiters in Cedar Mountain, N.C. He specializes in recruiting and placing network and telecommunications professionals nationwide and can be reached at (704) 884-4118.



ECONOMIC ISSUES

BY NATHAN MULLER

Dark side of global networking needs to be addressed

It is well documented that global networks have enabled corporations to secure a competitive advantage by expanding their geographical reach across national boundaries. However, global networking also allows companies to pick up and move operations on a moment's notice in pursuit of resources or profit. And that can be a big problem for the rest of us.

This form of globe-trotting, encouraged by the current federal tax code and trade policies, adversely affects workers in the U.S. as well as the domestic economy in general. The consequent loss of jobs and lower wages erodes the tax base and widens the national budget deficit. This sets the stage for more and higher taxes to make up for revenue shortfalls. Continued overspending increases the national debt, which robs future generations of the resources they will need.

Increasingly, global networks are being used to obfuscate corporate structures. With lightning speed, global networks enable companies to change their identity from that of parent to subsidiary, partner, independent contractor or licensee. Consequently, it not only becomes more difficult to determine where specific products are made, but also what company made them and how they should be taxed. Because government auditors cannot always



untangle such complex webs, tens of billions of dollars in tax revenues go uncollected each year.

It is ludicrous to think that we can long endure such global networking-induced economic and social changes without national policies that address these and the related issues of education, high-wage jobs creation, infrastructural investment and the transition from a military-driven economy to a market-driven economy. Left unaddressed, the growing disparities in income and tax burden, as well as access to education and jobs, threaten to bring about massive social turmoil.

To ensure that this scenario doesn't happen, we have to look up once in a while from our computer screens and technical manuals, and become more aware of what is going on around us. Although we appreciate the benefits that technology such as global networking can provide, what is often lacking is an understanding of the economy and how such technology can be harnessed and directed toward achieving national goals, instead of quarterly profits and tax avoidance, exclusively.

Ross Perot, chief executive officer of Perot Systems, Inc., and J. Peter Grace, CEO of WR Grace, have helped publicize these and other important issues, and have set up national organizations to encourage government to be more responsive. Joining Perot's United We Stand America or Grace's Citizens Against Government Waste is a recommended first step to becoming more informed. What you learn may make you angry. More importantly, it may encourage you to participate in shaping the future, instead of letting others who are less informed or privately motivated shape the future for you.

Muller is an independent consultant in Oxford, Conn., specializing in advanced technology marketing and education. He can be reached at (203) 881-1650 or via MCI Mail at 546-4889.

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Senior Consultant, Hughes Aircraft Co.
Chairman, User Alliance for Open Systems

Michael Kaminski
Manager, CIM/Networking Technologies
General Motors Corp.

Michael Kilbane
Senior Advisor, International Communications Association
General Manager of Systems Development,
Diamond Shamrock

Ron Kopitowsky
Telecommunications Director, Metropolitan
Transportation Authority of New York State
First Past President
Communications Managers Association

Charles Murray
President, Communications Managers Association
Telecommunications Director, The Travelers Insurance Co.

Chuck Papageorgiou
Manager, United Parcel Service

Henry Pfendt
Director, Information Technology Services,
Eastman Kodak Co.

Kenneth Phillips
Vice-President, Office of Telecommunications Policy,
Citicorp
Chairman, Committee of Corporate
Telecommunications Users

William Pomeroy
Director of Telecommunications Public Policy,
International Communications Association

Richard Sidoli
Telecommunications Director, Morgan Stanley

Laura Swanton
President, NetWare Users International
Hughes LAN Systems, Inc.

Jane Videtich
President, International Communications Association
Systems Development Manager, R.J. Reynolds Tobacco Co.

Stanley Welland
Manager, Corporate Telecommunications
General Electric Co.

Ronald West
President, Association of Data Communications Users
Manager of Telecommunications and Office Automation,
Shearman & Sterling

EDITORIAL

Unix needs more than a public relations boost

A couple weeks back, we pondered which vendor would control the application platform of the '90s — Microsoft Corp.'s Windows NT, IBM's OS/2, Unix or, on a different plane, Novell, Inc.'s NetWare 4.0.

But our question needs to be revisited in light of the new Unix consortium that, under the threat of NT's release, has promised to deliver a "common open software environment."

Does the consortium change the landscape? Not really.

One of Unix's biggest problems is public perception. Plenty of users have downsized, right-sized or whatever to Unix platforms; but the hard fact remains that, in the commercial world, Unix is often viewed as foreign technology and the Unix com-

munity as a fragmented one.

Even worse, users recall unification efforts that sparked and sputtered. Unix pioneered features critical to distributed computing, but it needs a public relations boost and the consortium's efforts may not be enough.

In establishing share of mind, you need a simple, bold message. That explains why NT is beating OS/2 in the PR game when NT isn't even shipping. Microsoft's got a powerful, cross-platform message that sells to users and developers.

The consortium isn't saying what people want to hear most — that it will deliver a common Unix. It's talking about using this and that technology, new and existing, to provide a common look and feel across platforms

and ease development. Oh.

It's questionable whether rivals will pull together an amalgam of technologies that won't wind up being a watered-down solution.

Their plan is sketchy and will take precious time — the first implementations of this common desktop won't debut until mid-1994. In the meantime, OS/2 is out, NetWare 4.0 will ship soon, and NT will ship this summer.

This isn't a zero-sum game — all these technologies will play a role in the distributed future. But despite the powerful forces arrayed in this consortium, the PR battle still runs in Microsoft's favor and the juggernaut won't be slowed, even if NT doesn't prove to be the best solution. **Z**

LETTERS

Virus attack

So Michel Kabay wants to limit the ability to publish viruses ("Viruses should not be protected by First Amendment," *NW*, March 1). He's treading on a slippery slope.

Who is to decide exactly what is to be published and for what purpose? The ability to create a computer virus is, after all, an intellectual exercise. Who is to decide what it means to think?

A few years ago, I developed

code that, under certain circumstances, causes processors to lock up. Was this a computer virus? The code controls nuclear weapons, so we thought this would be a good way to provide protection.

If we want to protect ourselves from viruses, how do we research them? The process of peer review may have its flaws, but, on the whole, it has proved to be the best means of promoting technology advancement. At the heart of

peer review is the freedom of thought and, therefore, to publish. If we continue to allow the "thought police" within our society to encroach on our freedoms, we will eventually sink into the black hole from which they only recently have started to crawl out.

Geoffrey Lampshire
Chief executive officer
Advanced Automated Business
Computing Systems
Worcester, Mass.

Begging to differ

I am the administrator for a NetWare local-area network, and I am currently seeking Certified NetWare Engineer (CNE) certification.

As such, I beg to differ with James Carlini's assertions regarding the CNE program ("It takes more than a CNE to manage a network," *NW*, March 8).

I don't know where Mr. Carlini got the idea that becoming a CNE requires one test. Perhaps he was thinking of the Certified NetWare Administrator program.

A CNE, however, must pass seven tests: one on DOS and microcomputer hardware, two on the NetWare operating system, one on service and support, one concerning an in-depth overview of networking technologies, and

two electives. Electives include some of NetWare's add-on services, such as Transmission Control Protocol/Internet Protocol support or mainframe connectivity.

Although the only operating system covered is NetWare, a CNE must be extremely knowledgeable about technical connectivity issues. It is this knowledge that makes certification so hard to get and what makes it desirable to employers.

I suggest Mr. Carlini check his facts before denouncing the time and effort CNEs have put into achieving their status.
Amaryllis Beirne-Key
Assistant computer systems
coordinator
Swiss American Securities, Inc.
New York

Hire education

James Carlini's recent opinion piece on NetWare certification makes some good points, but he doesn't understand the Certified NetWare Engineer (CNE) qualification process. I agree that CNE certification alone does not qualify one to manage network technology. Experience, supplementary education and a basic desire are also serious requirements.

Mr. Carlini's questions regarding hiring processes are valid: Certification must be used as the basic platform for hiring but not as the only requirement. CNE certification is no replacement for long-term study or learning in the trenches. But if I had two applicants for a NetWare job who had similar backgrounds and one was a CNE and one wasn't, I

would hire the CNE.
Russell Dean Vines
Director of MIS
The Children's Aid Society
New York

The bottom line

I agree that possessing a Certified NetWare Engineer (CNE) [degree] alone does not qualify one to manage a net. What it does provide, however, is a certain amount of product knowledge.

The bottom line in network management skills is experience, not classroom training or vendor training.

Daniel Cashman
Senior systems support analyst
(and CNE)
The Boston Company
Boston

Seeking justice for CNEs

I am astonished at James Carlini's remarks regarding the Certified NetWare Engineer (CNE) program. Obviously, Mr. Carlini has not taken the time to research the requirements for the certificate. Nor does he do any service to the people who have passed the CNE exams.

When I entered the communications field nearly 20 years ago, a Federal Communications Commission license was required for one to work on equipment capable of broadcasting into the atmosphere. When the government ceased regulations on licensing, the radio industry created a certification program to fill the void. What the license and the subsequent certificates provide is a benchmark to gauge prospective employees.

Resumes are usually embellished to make the prospect appear to be the best engineer or technician since Einstein. However, high-technology companies usually have a staff of experienced technical professionals who can interview employment candidates and weed out those that lack the specific job criteria.

But how does a [nontechnical] employer interview candidates for a technical position? By using an industrywide approved testing program such as CNE, employers have a starting point in their evaluation of applicants. This, of course, should not be the only criteria — merely a beginning.

Rudolph Schubert
Consultant (and CNE in progress)
R S S Consulting Services
Mineola, N.Y.

Get what you pay for

While I agree with James Carlini that Certified NetWare Engineer (CNE) certification should not be the sole reason or criteria for hiring someone to manage your net, I must disagree with his comments on how easy it is to be certified. His article mentions that by taking a two-day class and passing a test one may become a

CNE. While taking the classes is not a requirement, the candidate must take at least seven tests and be fairly knowledgeable in those areas in order to pass.

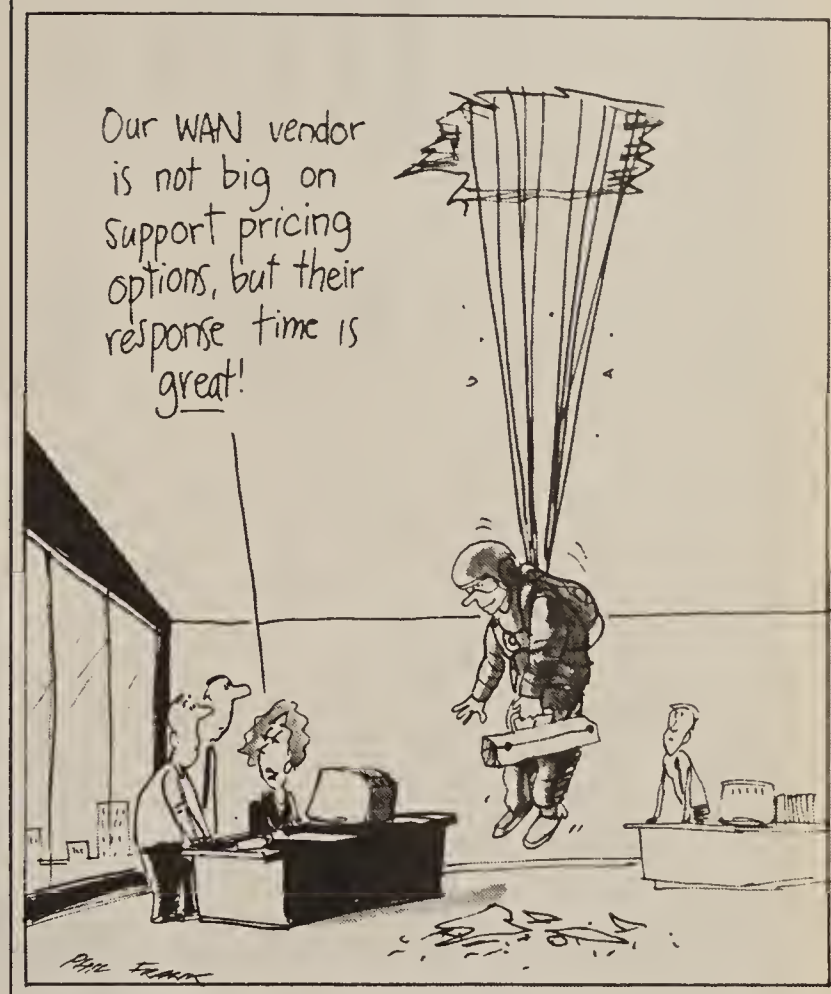
While I hope Mr. Carlini's class is the exception and not the rule, I can't help but wonder how many of his students were actually CNEs and how many were working on becoming CNEs. It has

been my experience that many companies do not put their most knowledgeable people into the local-area network area. The attitude is usually "anybody can do that," and the result becomes "you get what you pay for."

Kevin Benton
Consultant
Benton Enterprises
Ponca City, Okla.

TELETOONS

BY FRANK AND TROISE



Back to the basics

In order to pass the Certified NetWare Engineer (CNE) tests, a candidate must have extensive practical experience or complete many hours of classroom instruction. The Novell, Inc. courses provide theory of operation and hands-on instruction to enable students to understand the technology behind the everyday process of administering a local-area network. Westcon, the training center where I teach in the evening, provides open lab time for students to practice their newly learned skills.

A three-credit college course or the full Novell training regime does not make someone a LAN administrator. But the CNE certification does let prospective em-

ployers know that a basic body of knowledge about LANs — and Novell LANs in particular — has been mastered.

William Burton
Manager, technical services
Realtech Systems Corp.
New York

Editor's note: Network World called Novell's Education Group to clarify the CNE qualifications. Novell says that to be certified, a candidate must take and pass seven tests; all seven tests must be taken within a year from the date that the first test is taken. No specific amount of classroom time is required, but courses and self-study materials are available.

James Carlini's response: I am not against NetWare and its related Certified NetWare Engineer (CNE) training. But I still stand behind the basic premise of my argument: Taking a course on one type of first aid doesn't make you a doctor.

People who called to defend the CNE program did not have much to say when I asked them about new technologies on the horizon, such as Windows NT. Whatever Windows NT will offer as far as networking software, it will require new skills. Won't a CNE become obsolete? Or what about CNEs that have not yet worked on NetWare 4.0?

It is good to have training on any hardware or software product. It is not good to make it anything more than that. A CNE with its related coursework should not be viewed as anything more than a product-specific training program that provides the student with some basic skills and tests for some proficiency.

A CNE, a college degree, an MBA — all have limited shelf lives. To manage today's networks, you have to constantly adapt and learn new things. There are no experts in telecommunications — the best you can become is a good student. Keep on learning!

Building anew or adding on

By ANURA GURUGE

*IBM's revamped LAN
internetworking
strategy gives users
more options.*

Spurred by competitive pressure, humbled by cataclysmic financial woes and rejuvenated by a perceptive and incisive Networking Blueprint, IBM's LAN internetworking strategy has matured and blossomed over the past year.

Today, IBM preaches a three-pronged strategy that gives users the choice of building totally new local-area network internets using routers such as its 6611 Network Processor bridge/router or bridges such as its 8209 Ethernet-to-token ring bridge and Token-Ring Network Bridge Program. Users can also employ 3745 Communication Controllers stand-alone or in conjunction with 6611s to add LAN internetworking to an existing Systems Network Architecture net.

This is in stark contrast to the days when IBM's LAN interconnection prowess was limited to source route bridging (SRB) between token rings.

Clearly, using SRB to interconnect token rings is no longer IBM's favorite panacea for all LAN internetworking needs. Instead, IBM's new goal is to be all things to all people. Big Blue is even adding support for Ethernet to new and existing products as it never has before (see "IBM's open road for apps," page 44).

IBM's users are well aware of the market forces responsible for this shift. The changes that IBM has instituted are the result of the situation it is currently in, says Bob Richards, computer communications consultant at Union Carbide Industrial Gases, Inc. in Danbury, Conn. "[IBM is] in financial troubles. The rest of the world is passing them by, and they better wise up and catch up."

Following the route

Introduction of the 6611 was a major step in IBM's attempt to catch up. With the 6611, IBM is now able to offer customers the option of building

far-flung, complex, multiprotocol, high-speed LAN internets using state-of-the-art bridge/router technology equivalent to that provided by market leaders Cisco Systems, Inc. and Wellfleet Communications, Inc.

Net managers can use the 6611 to connect LANs to a large SNA net or build router-based LAN internets that are totally devoid of any SNA or Advanced Peer-to-Peer Networking (APPN) traffic.

IBM advocates using the 6611's routing capabilities to support internetworks of 40 or more LAN segments, or when routable protocols represent at least 40% of the LAN traffic. Routing has several advantages over SRB bridging in these environments.

With routing, users no longer have to contend with SRB broadcast search-

6611 stigma
Two-thirds of the 1,000 largest U.S. companies claim that IBM's 6611 Network Processor will not impact their internetworking plans because IBM lacks credibility as an internetworking vendor, according to a Forrester Research, Inc. study.

es, which generate heavy traffic by propagating LAN packets across the entire network in the hope of finding the intended destination. Routing also permits an internet to be partitioned into autonomous domains, which is an effective way of keeping traffic between nodes in the same domain from traversing the entire internetwork.

The user with routing also has the added benefits of dynamic alternate routing and criteria-based adaptive routing. Criteria-based adaptive routing enables users to associate a criteria — such as fastest, shortest, most expensive and least secure — with the path they want certain traffic to take.

The 6611 enables users to take advantage of these routing benefits.

In terms of features, particularly those for supporting SNA or Network



Basic I/O System traffic, the 6611 is essentially comparable to a midsize Cisco MGS bridge/router. Like the Cisco product, the 6611 — which comes in a four-slot version sold as the Model 140 and a seven-slot version sold as the Model 170 — can concurrently route Transmission Control Protocol/Internet Protocol, Novell, Inc.'s Internetwork Packet Exchange (IPX), Xerox Corp.'s Xerox Network Systems, Digital Equipment Corp.'s DECnet Phase IV and Apple Computer, Inc.'s AppleTalk Phase 2. Support for APPN routing has been added this month (see "APPN finally on the 6611," page 46).

The 6611 also supports the Routing Information Protocol, Open Shortest Path First (OSPF), or, as of this past January, the Border Gateway Protocol. These protocols enable routers to communicate when they need to update their routing tables or check destination reachability status, for instance.

The wide-area network links that the 6611 supports include T-1/E-1, frame relay, X.25 and the Point-to-Point Protocol (PPP), which is a multivendor encapsulation standard for data being transmitted across serial lines. With PPP, OSPF and APPN Network Node (NN) support, a 6611 can interoperate with other vendors' bridge/routers, although typically on a protocol-specific basis.

For example, OSPF would be used when IP traffic is routed, and APPN would be used when LU 6.2 traffic is routed. During 1993, IBM's competitors, including 3Com Corp., will offer APPN NN capabilities on their bridge/routers.

The 6611 can also act as a multiport source routing or source routing transparent (SRT) bridge. Although the 6611 can bridge almost any LAN protocol, most users are interested in its ability to bridge SNA, NETBIOS and DEC's Local Area Transport (LAT), which contemporary routers are unable to natively route.

While deploying the 6611 exclusively as a bridge will typically be more expensive than using one of IBM's other bridge products, it offers more LAN and WAN ports than IBM's other bridges. If a user with 6611s deployed as bridges decides to upgrade to a router-based network, having 6611s already in place will smooth that migration considerably.

Data Link Switching

In addition to bridging, the 6611 provides a repertoire of value-added functions for supporting SNA, APPN and NETBIOS traffic that are collectively referred to as the Data Link Switching (DLSw) facility. The first of these functions is a Synchronous Data Link Control link to token-ring 802.2 Logical Link Control 2 (LLC2) conversion. In other words, the 6611 receives SDLC traffic from devices such as cluster controllers and puts LLC2 traffic out over the router network. External stand-alone devices from vendors such as Sync Research, Inc. and Netlink, Inc. can also perform this function.

The second function is local LLC2 acknowledgment. Rather than having LLC2

Receive Ready (RR) acknowledgments sent end to end, the 6611 issues them locally to end devices using a spoofing technique. This eliminates the risk of time-outs when the remote host may retransmit data packets or even close down the link because it has not received an acknowledgment for previously transmitted data after a certain time period. RRs acknowledge previously received data packets and give the RR recipient permission to send additional packets.

The ability to encapsulate SNA, APPN or NETBIOS traffic within IP datagrams and route those IP datagrams is another DLSw function. This encapsulation introduces overhead, but compression can minimize that. Given that the 6611 cannot natively route SNA and NETBIOS traffic, the added overhead is a necessary evil.

In addition, DLSw maintains a directory that keeps track of media access control addresses and NETBIOS names, thus eliminating the need to continually locate

remote destinations using SRB broadcast searches. That results in less overhead traffic across the router net, which frees bandwidth for data transmission.

To cost-effectively integrate small branch office LANs into a 6611-based backbone, network managers can use IBM's Route/Xpander/2, which is OS/2-based software that works in conjunction with IBM's two-port PC Wide Area Connector card. One port on the card can work at speeds as high as 2.048M bit/sec, while the other can operate as high as 64K bit/sec. The Route/Xpander/2 can act as a source routing bridge or a TCP/IP or APPN router over frame relay networks. This choice again is based on the traffic mix (see Figure 1, page 46.)

IBM now supports the 802.3 Ethernet standard on the 6611, which recently began supporting transmission of SNA traffic over Ethernet. The 6611 will support Ethernet interconnection using either protocol-independent, transparent bridging or multiprotocol routing.

A question of perception

The 6611 has been available since September. Independent laboratory tests have repeatedly indicated that its performance, in representative benchmarks, is acceptable and, in some instances — particularly when acting as a remote bridge — could even be better than most bridge/routers. Despite these results, there is a widespread and, most likely, unwarranted perception that the 6611 is a loser. This stigma appears to have started last June, when IBM abruptly announced the week before the 6611 was initially scheduled to be available that it was delaying shipments of the product by three months.

IBM's familiarity with some of the protocols supported by the 6611 is also an issue. "There have been statements about the 6611 being able to support not only SNA, but also DECnet, DEC LAT and Novell IPX traffic," says DeWitt Hodge, manager of communications systems for Kaiser Per-

(continued on page 44)

Cost of LAN administration

The cost of administering a 5,000-user IBM Systems Network Architecture net is about one-third the cost of supporting a comparable LAN-based network, according to Forrester Research, Inc.



IF YOU THINK GETTING
AT&T INTERSPANSM
FRAME RELAY SERVICE IS
A SMART MOVE
YOU'RE IN GOOD COMPANY

JUST ASK
HALLIBURTON...

IBM's open road for apps

A year ago, IBM made its most significant networking announcement since the introduction of Systems Network Architecture 18 years ago — the Networking Blueprint.

The Blueprint advocates the use of network-type independent application program interfaces (API) when building new networked applications. These APIs will provide access to a variety of backbone network services and protocols, a drastic difference from the current requirement of developing applications that are specific to a certain network type.

Thus, according to the Blueprint, future applications will not be categorized as an SNA/Advanced Peer-to-Peer Networking (APPN), Transmission Control Protocol/Internet Protocol, Network Basic I/O System, Novell, Inc. Internetwork Packet Exchange (IPX) or Open Systems Interconnection application.

Instead, network applications will be known by the communications API they use and the repertoire of backbone networking services accessed via that API.

The top three

The Blueprint endorses three strategic APIs: the Systems Application Architecture Common Programming Interface for Communications (CPI-C), remote procedure calls (RPC) used in the Unix world and the nascent Message Queuing Interface (MQI).

Through CPI-C, applications can access the rich set of transaction processing and distributed database access/update-oriented services provided by IBM's Advanced Program-to-Program Communications LU 6.2 or, in the future, OSI's Transaction Processing (TP) service.

With an RPC interface, applications can access Unix-oriented networking services available in the form of the Open Software Foundation, Inc.'s (OSF) Distributed Computing Environment (DCE).

Finally, MQI is a protocol-independent, store-and-forward, queued message-driven technique for transaction processing that is now being defined in the U.K. by IBM and the U.K. Standards Authority.

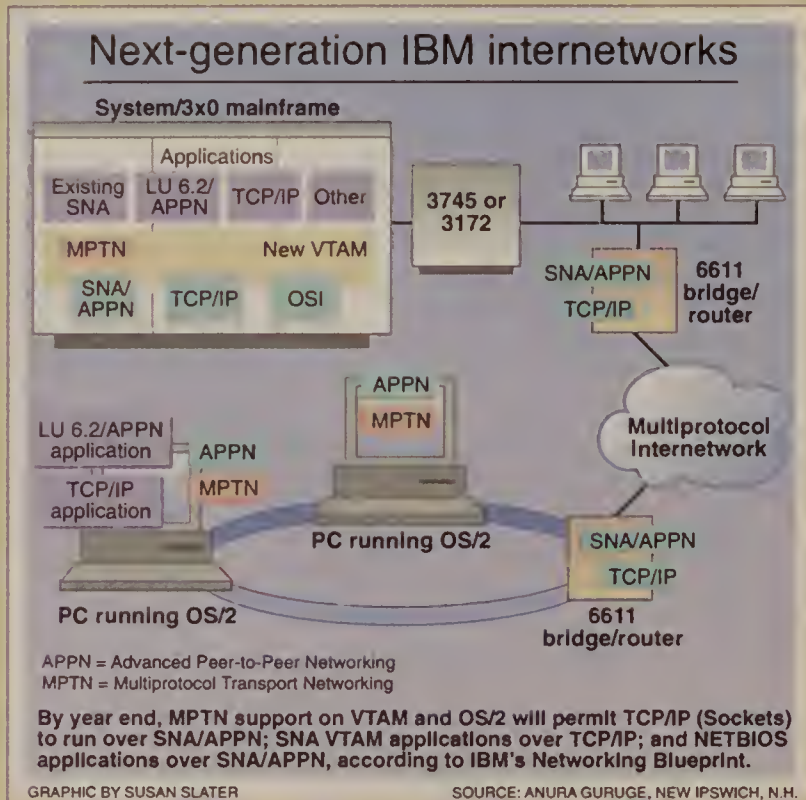
The essence and magic of the Blueprint is in the layer below these services — the Common Transport Semantics (CTS). CTS, in theory, will enable interactions emanating from applica-

tions that use LU 6.2, OSI TP, OSF DCE or MQI to be transported over a network using SNA/APPN, TCP/IP, OSI or, on an interim basis, NETBIOS or IPX protocols.

Therefore, the Blueprint makes it possible to take an application that uses CPI-C/LU 6.2 and have it run over a TCP/IP network or even an OSI network. Similarly, the Blueprint makes it possible to take an application developed around

Not only does CTS offer network-type independence, but it also has the ability to freely interconnect network types with net devices such as the 6611 Network Processor bridge/router, hosts or 3745 Communication Controllers performing the necessary protocol conversions.

Implementations of the Blueprint CTS technology — referred to as Multiprotocol Transport Networking (MPTN) soft-



RPCs and OSF DCE and deploy that across an APPN network.

The good news

The upshot of all this is that the Blueprint promises mix-and-match computing that is independent of a network type. Now users are treated to a welcome change by not being forced into adopting a particular network type based on the applications they intend to use.

For example, users will no longer have to implement an OSI network to use OSI's File Transfer, Access and Management (FTAM) or an SNA network to use LU 6.2-based applications.

The Blueprint goes even further. CTS, if invoked at either end of a client/server application, will provide on-the-fly protocol conversion. This capability makes it possible to successfully deploy a client/server application where the client is running APPN on a personal computer while the server is running TCP/IP on a RISC System/6000.

In many ways, this conversion capability is as close to networking utopia as a user can get.

ware — will become available this year on the 6611, hosts and OS/2 workstations. IBM is already publicly demonstrating MPTN on a PC running OS/2 and on System/3x0 hosts.

On the host side, VTAM 3.42, which was announced March 11 and is scheduled to be available in June, will permit SNA LU 6.2 VTAM applications to run on top of TCP/IP.

It will also allow Unix Sockets applications that would typically work over TCP/IP to interact with one another across SNA LU 6.2 (see graphic).

Thanks to MPTN, an application in the form of client and server components can interact with one another across any internetwork configuration using SNA/APPN, TCP/IP or, eventually, OSI.

Given the protocol conversion capabilities of CTS/MPTN, it is even possible to run SNA/APPN on the clients, under OS/2, for instance, and TCP/IP on the server or vice versa. As a tactical, interim measure, MPTN may even support NETBIOS or IPX protocols as indicated in the Blueprint.

— Anura Guruge

(continued from page 43)

manente in Oakland, Calif. "But I view these with skepticism because I don't know of that many applications out there and I don't know of that many environments that IBM is really familiar with [in order] to walk into a DEC shop and work with them on how to route their traffic."

Perception is IBM's current stumbling block in trying to establish the 6611 as a premier router. In truth, IBM is fully capable of supporting all of these protocols and environments, and such skepticism is unjustified.

The problem arises because IBM has yet to aggressively promote the 6611 to dispel the nagging doubts and position it as a bridge/router equal in ability to other market-leading bridge/routers. This aggressive promotion is bound to happen this year, possibly in the form of a gala re-launch replete with a souped-up 6611 that has impressive performance numbers, greater throughput and, even more importantly, credible customer testimonials.

IBM must also overcome other flaws in the 6611, specifically its inability to route Open Systems Interconnection and Banyan Systems, Inc.'s VINES protocols, as well as its lack of support for Fiber Distributed Data Interface and 3270 Binary Synchronous Communications links.

Nonetheless, given its relatively comprehensive routing and DLSw capabilities, the 6611 could be used to construct internets that either contain no SNA traffic of any type or those that contain some SNA traffic. SNA/APPN traffic destined to a host could originate on a remote SDLC link or from a LAN. This traffic

Perception is IBM's current stumbling block in trying to establish the 6611 as a premier router.

can be funneled to the host by attaching a 6611 to a LAN that also contains an SNA LAN gateway. Typical SNA LAN gateways would be a 3745, a 3172 Establishment Controller or even a channel-attached 3174 Establishment Controller.

The exact choice of which SNA LAN gateway to employ will usually be determined by throughput capacity and the need for other

SNA gateway functions such as SNA Network Interconnection (SNI), which links separate SNA networks. In addition, the user may have a piece of equipment already installed that can serve as a gateway.

Given the DLSw features, a 6611 could be used to displace re-

IBM hasn't totally abandoned bridging just because it now has a router.

▲▲▲

remote 37XX Communication Controllers just as a Cisco or Wellfleet router with a Netlink gateway combination could.

Although displacement of remote 37XXs is now fairly common, particularly as a cost-saving measure, users should remember that no bridge/router, including the 6611, can duplicate or emulate the bona fide SNA routing performed by remote 37XXs.

"We have two 3745s installed here now and a remote up in Tonawanda [N.Y.]," says Union Carbide's Richards. "I think once we get the router network in, the remote will go away, so we'll reduce from three 3745s down to two. That will save on maintenance charges." It could also allow the company to sell the 3745 hardware, he adds.

A bridge too far

Having assiduously promoted bridging as the only way to interconnect LANs for more than five years, IBM hasn't totally abandoned bridging just because it now has a router. Indeed, bridging is still presented as a perfectly valid and practical technique for LAN interconnection.

IBM advocates bridging if the bulk of traffic in a small to mid-size LAN internet of 50 segments or less is SNA and NETBIOS, given that NETBIOS and SNA can't be routed.

In addition to providing bridging functions on the 6611, IBM offers users the option of the IBM Personal System/2-based Token-Ring Network Bridge Program or the 8209. These old bridge products are still available and actively marketed.

For many years, IBM supported SRB to interconnect token rings. But when IBM realized that many of its customers needed to interconnect Ethernets, as well, it developed SRT bridging and presented it to an IEEE 802 committee in March 1990 for adoption as

a standard. While the committee has yet to accept it as a standard, SRT permits a bridge to concurrently perform token-ring SRB as well as transparent bridging, the latter of which is used on 802.3 Ethernet LANs. Therefore, SRT allows the same bridge to simultaneously support devices that use SRB or transparent bridging.

SRT is a scheme for coexistence rather



than interoperability of token ring and Ethernet. Coexistence means that Ethernet and token-ring devices can work side by side. With interoperability, a user can switch from one type of net to the other. Token ring-to-Ethernet interoperability is provided by Source-Route Translation Bridging (SR/TLB), which is available on IBM's 8209.

SR/TLB is not currently available on the 6611, although it is a feature supported by Cisco routers. Users of the 6611 that require such interoperability could outfit end devices, such as personal computers, with appropriate software and use a routable protocol. The software in question will be the users' actual application software. If it does not support a routable protocol, such as NETBIOS, then the user can't employ routing as a way of moving traffic from a token ring to an Ethernet.

New use for 3745

Users that want to internetwork large SNA networks and LANs have a third option: using the 3745 as a router. Pursuing this approach allows net managers to further extend and leverage their considerable investment in SNA knowledge, experience and operational procedure while getting up to speed with the 6611 or obviating the need to invest in the alien 6611 technology altogether.

Using the venerable but now long-in-the-tooth 3745 as a LAN router may come as somewhat of a surprise to many, including skeptics who do not consider the 3745 to be a router. But it shouldn't come as a surprise at all.

IBM included the 3745 on a list of internetworking options that was part of a January announcement detailing enhancements to the 6611. Back then, IBM noted that the 3745 can be bolstered with the 3746 Expansion Unit Model 900, which provides high-performance adapters that link 3745s to token rings. The Model 900 will be available in June.

Users have been quick to detect IBM's desire to exploit SNA as a means of LAN interconnection. "I think IBM's LAN strategy is to no longer ignore [LANs], but rather to heavily participate in [LAN environments]," says Paul Dover, staff manager of communications for United Telephone of Florida in Winter Park.

According to Dover, most companies have an existing SNA backbone, which IBM is attempting to leverage. This strategy is particularly evidenced by IBM's recent 3745 announcements.

Users looking to meld a great deal of LAN traffic into their already large SNA networks can employ 6611s, Route/Xpander/2s, other bridge/routers or possibly simple bridges to feed traffic into 3745s acting as frame relay switches on a private frame relay network, which many users are building to support LAN interconnection (see Figure 2, page 46).

Bridges and bridge/routers will use that frame relay network for end-to-end interconnection. They will be totally oblivious to the fact that the frame relay network is being provided by 3745s that are also supporting SNA traffic on the same physical circuits. To accomplish this feat, the 3745 slices up the bandwidth on the frame relay circuit into time slots, dedicating some for internetwork traffic and others for SNA traffic. Currently, the 3745 does not support frame relay but will when the Network Control Program (NCP) Version 6 Release 2 is available in June.

Users with limited LAN traffic have a less costly option. They can use existing 3745s for LAN interconnection but without an auxiliary feeder network of bridges or bridge/routers. Depending on the configuration, the LAN will be attached direct-

Using the 3745 as a LAN router may come as a surprise to many.



ly to the 3745 or through an SDLC link.

This approach requires the use of either IBM's PC-based LAN-to-LAN Wide Area Network Program (LTLW), which has been available since mid-1991 and encapsulates NETBIOS traffic in SNA LU 6.2, or Novell's PC-based SNA Links, which encapsulates NetWare IPX/Sequenced Packet Exchange (SPX) traffic in SNA LU 6.2. IBM resells SNA Links as a part of its strategic marketing alliance with Novell.

PCs running LTLW or SNA Links act as a communications controller, physically connecting LANs to the 3745-based SNA network. In the case of LTLW, the PC must run OS/2 Communications Manager and LTLW. With SNA Links, the PC must run NetWare and SNA Links. In addition, it will function as a NetWare server.

To allay any doubts about IBM's commitment to LTLW or its viability as an option for interconnecting NETBIOS-only LANs, IBM essentially reannounced it in January, this time with a "lite" version that supports only 10 PCs per LAN — as opposed to the theoretical limit of at least 40 for the regular version — and with particular emphasis on customers using Lotus Development Corp.'s Notes.

IBM said it hopes that because the lite version is less expensive, it will be more attractive to users.

(continued on page 46)

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Sr. Network Engineer
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(continued from page 45)

By reannouncing the product, IBM has shown that it still believes in LTLW and doesn't plan to forget about it in the short

munication Controller using 56K bit/sec links in three minutes and 37 seconds.

Such performance for file transfer or casual file-server ac-

Two years ago, IBM demonstrated a prototype of such a switch — referred to as the Packetized Automatic Routing Integrated System (PARIS) — with a 6G bit/sec bus capable of 10 million packet/sec throughput. With such a switch, there will no longer be a need for the interconnection dichotomy that exists today.

By performing cell relay switching for some traffic, multiprotocol routing for other traffic and functioning as an SNA communications controller for other traffic, the same switch — in different hardware and software configurations — will emulate a 6611, a channel-attached 3745 or remote 3745 while at the same time functioning as a cell relay switch.

Adding frame relay support to the 3745 already provides a paradigm for this by showing how one box can act as both a frame relay switch and an SNA communications controller. Frame relay switching and cell relay switching are comparable switching technologies.

Today, thanks to the 6611 and the enhanced 3745, IBM customers have more LAN interconnection options than ever before. A few years down the road, they will have more, plus the potential for much higher speed networks. But in the future, they will use a single, scalable device that could be thought of as the grandson of today's 6611 in terms of progression but the great-great-grandfa-

APPN finally on the 6611

IBM may have finally added the Advanced Peer-to-Peer Networking (APPN) Network Node (NN) capability to its 6611 Network Processor bridge/router this month, but the initial implementation contains a surprise.

The APPN NN capability included with Release 1.2 of the 6611's control program, known as the Multiprotocol Network Program, requires the use of Transmission Control Protocol/Internet Protocol or token-ring Logical Link Control 2 (LLC2) to shuttle APPN traffic between APPN NNs.

This is accomplished by using either the native encapsulation of APPN within IP datagrams or using the 6611's Data Link Switching (DLSw) feature that can encapsulate LLC2 traffic within IP datagrams.

This version of the APPN NN on the 6611 will not be able to interact with any of IBM's other APPN NN implementations across a wide-area network using Synchronous Data Link Control, which is generally thought of as the native link protocol of Systems Network Architecture and APPN.

IBM's other APPN NN implementations can be found on Application System/400 minicomputers, personal computers, 3174 Establishment Controllers and System/36 minicomputers. APPN NN capability will be added to System/3x0 hosts in June.

Not only will the 6611 APPN NN perform intermediate-node routing of APPN traffic, but it will also support APPN End Nodes (EN) that are attached to the 6611 via a token ring or DLSw. Such token ring-attached APPN ENs could include PCs, AS/400s, 3745 Communication Controllers that are configured as Type 2.1 nodes using a current version of VTAM and Network Control Program software, as well as third-party APPN ENs or Type 2.1 nodes.

By mid-1993, the 6611 APPN NN will be able to readily interact with the APPN NN implementation on a 3Com Corp. NETBuilder bridge/router or with systems that use Data Connection, Ltd.'s SNA Protocol (SNAP)-APPN portable APPN NN software.

Other vendors, such as CrossComm Corp., plan to have APPN NN implementations by the end of this year. Thus, APPN is becoming a multivendor, bridge/router interoperability standard. Its interoperability capabilities, however, are limited to LU 6.2 traffic.

The 6611's current use of TCP/IP to route APPN traffic is incompatible with the scheme the Advanced Peer-to-Peer Internetworking Forum is promoting for sending APPN across TCP/IP. However, IBM has submitted its APPN-over-TCP/IP scheme to the Internet community as a bona fide request for comment, thus making it an open standard akin to APPI.

There is some justification for the initial lack of SDLC support on the 6611. In marked contrast to IBM's other APPN implementations, IBM has targeted the 6611 for participation in predominantly TCP/IP and token ring-oriented internetworking scenarios, as opposed to SNA/SDLC environments.

In other words, TCP/IP and LLC2 are the native protocols of the 6611. So implementing APPN on top of them — at least as an initial offering — does make some sense, given that IBM is fully committed to supporting more traditional link types, such as SDLC, X.25 and Ethernet, as soon as possible. At least in the case of SDLC and Ethernet, this will most likely be toward the end of this year, if not sooner.

While the lack of SDLC support is a temporary distraction, the key issue to applaud here is the availability of an APPN NN on bridge/routers. Thanks to this, LU 6.2 traffic will now be natively routable, whereas other SNA traffic can only be routed in nonnative form via source route bridging or IP encapsulation.

Therefore, LU 6.2 can now be positioned as a routable protocol alongside TCP/IP, Novell, Inc.'s Internetwork Packet Exchange (IPX), Xerox Corp.'s Xerox Network Systems, Banyan Systems, Inc.'s VINES, Digital Equipment Corp.'s DECnet Phase IV and others.

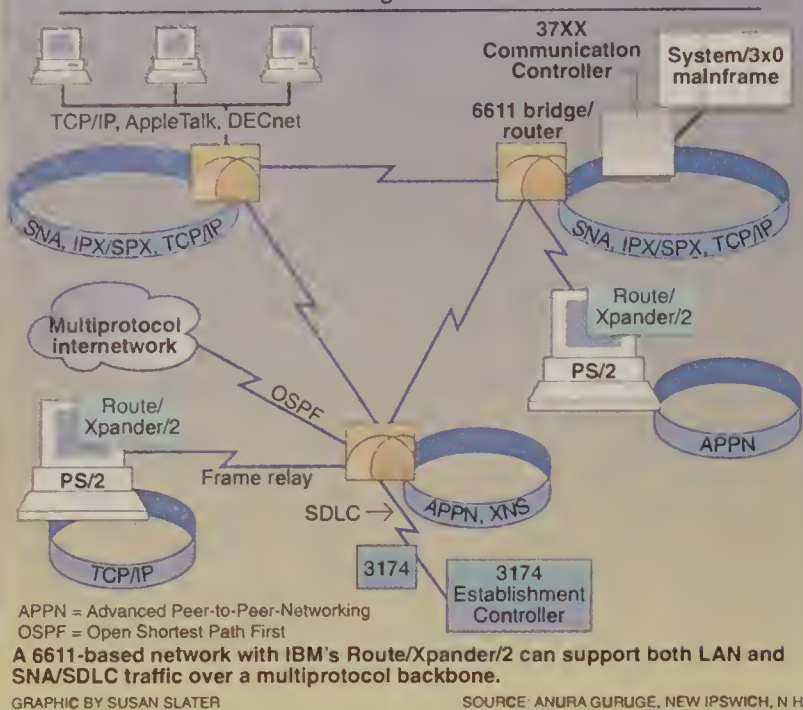
Sometime next year, SNA could be added to that list, provided IBM's Dependent LU Server/Dependent LU Requester (DLS/DLR) technology, which enables 3270 sessions to be routed across an APPN network, becomes a reality.

One drawback to DLS/DLR, however, is that it requires software upgrades to all remote 3270 devices and emulators. The implications of such an upgrade effort — particularly when nearly 50% of the installed base of 3270 devices/emulators are non-IBM — do not bode well for the success of DLS/DLR.

— Anura Guruge

The 6611's multiprotocol environment

Figure 1



term. As additional proof of its belief in LTLW, the company uses it extensively in-house, typically over 9.6K or 19.2K bit/sec SNA links.

Also, IBM now offers a way to interconnect local or remote Ethernets via 3745s running NCP Version 6 Release 1. Currently, the 3745's support for Ethernet interconnection is restricted to IP traffic or other traffic encapsulated within IP, which is in turn encapsulated in LU 6.2. IBM promises to deliver 3745 support for SNA over Ethernet within the year.

LTLW, SNA Links or, for that matter, the current NCP Version 6 Release 1's built-in facility for encapsulating TCP/IP within LU 6.2, are all, however, partial, single LAN protocol-only solutions. They support only one LAN protocol — when LANs are typically multiprotocol. So they don't support true LAN-to-LAN interconnection, as each product allows only one protocol to pass through.

While IBM will continue to market these potential solutions, IBM's main thrust for 3745/3746-based LAN interconnection will be the forthcoming support for frame relay on the 3745.

In any scenario involving 3745s, however, concerns about performance will be a constant specter. Recent independent tests confirm that performance is still adequate for many LAN interconnect applications, though not in the range of high-end bridge/routers.

For example, the actual performance figures for Novell's SNA Links show that a 1M-byte file can be transferred LAN-to-LAN via a 3745 Model 170 Com-

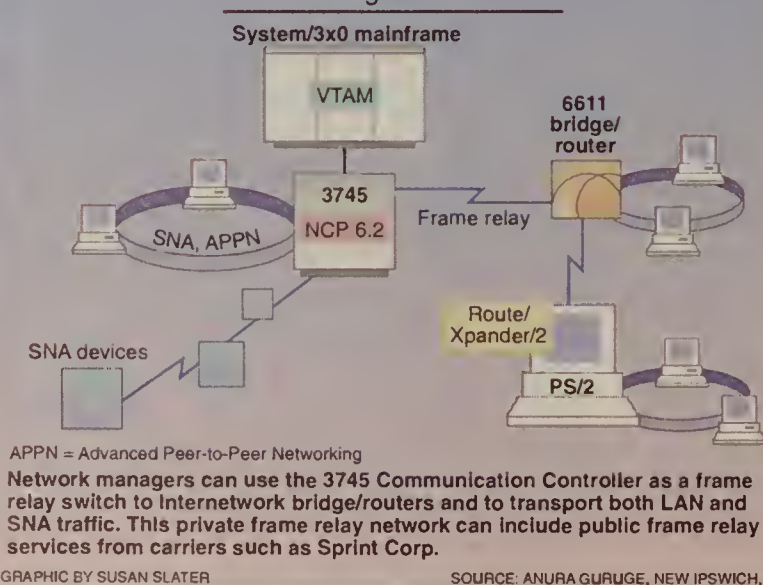
cess will be deemed acceptable in many cases. The key to this is the use of 56K bit/sec and higher SNA links for LAN interconnection as opposed to the sub-19.2K bit/sec links traditionally associated with SNA networks.

A future course

IBM's current 6611- and 3745-based LAN internetworking options, although workable, ap-

Framing the 3745

Figure 2



pear to have a three- to four-year window of applicability. During that period, IBM will standardize on a very high performance, cell relay switch that will embody the functions of a bridge/router, an APPN node and a host channel-attached SNA LAN gateway. This cell relay switch will inevitably be based on IBM's Performance Optimization With Enhanced RISC (POWER) technology, which is the heart of the RS/6000, the 6611 and IBM's POWERparallel Supercomputer announced in February.

ther of the 6611 in performance and capability. ■

Guruge is an independent consultant specializing in internetworking and IBM network architectures. He writes extensively, presents seminars worldwide and can be reached at (603) 878-1303 or via Internet/MCI Mail at aguruge@mci.com.

Associate Features Editor Alison Conliffe contributed to this article.

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Testing AT&T's ATM over twisted pair

Line explosions, three-meter limit between nodes need ironing out.



MORRISTOWN, N.J. — *Network World's* recent laboratory testing of AT&T's bold but unlikely matchup of new technology and old has revealed certain limitations that might deter network planners from quickly implementing this.

Researchers discover E-mail black hole

Millions of messages unearthed in Cleveland warehouse.

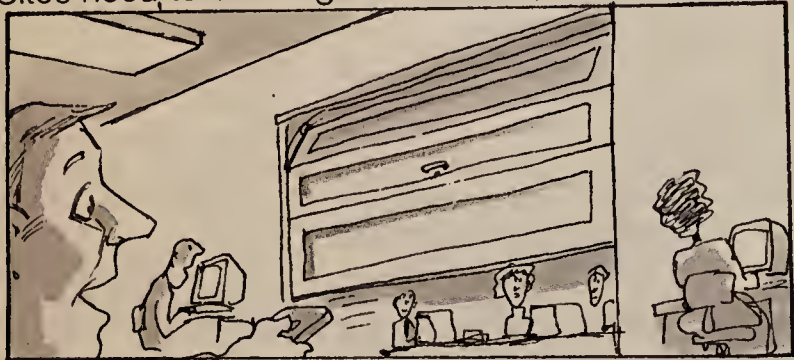
CLEVELAND — Hundreds of hours of investigation by a coalition of network technicians from around the country paid off yesterday with startling results when a warehouse be-



lieved to contain every lost E-mail message of the past five years was precisely located by sophisticated network analyzing equipment. "This is only the beginning."

Microsoft sells off windows, switches to garage doors

Cites need to challenge Sears in expanding market.



REDMOND, Wash. — Seeking new ways to satisfy the fast-growing need for larger gateways to enterprise networks, Microsoft Corp. has announced a new product line.

analysts by introducing an extensive new product line of high-speed (12 OPS, or openings per minute) garage doors powered by wireless devices easily carried in

Sprint publicity stunt backfires

Thousands punctured.

Story: (OOPS Wire Service) Thousands of lunchtime strollers were sent diving for cover today when a dirigible dropped thousands of pins on several major American cities. The incident, tied to an ad campaign promoting the sound quality of telephone lines, was a



Lotus issues Notes upgrades

New 'LegalPad' is already popular

PHOENIX — Sporting bright new yellow packaging, the new LegalPad enhancement to Lotus Notes is proving very popular with users seeking a simple way to add imaging to their system. "There's little doubt we are more productive with this quick and easy way to pass rough schematics, flow charts and even small data-



AT&T urges court to break up FCC

Ma Bell wants deregulation of regulatory monopoly.

WASHINGTON, D.C. — Just as Judge Greene was contemplating retirement, AT&T has added a new wrinkle to the long-standing AT&T/FCC regulatory battles.



out to competitive bid," stated a Ma Bell executive who spoke on a condition of anonymity. "Perhaps a loose consortium of small, efficient foreign dictatorships could

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NOS' no-fault insurance varies widely

Novell, Inc.'s NetWare System Fault Tolerant version stood head and shoulders above other products in a recent evaluation of fault tolerance provided in network operating systems (NOS).

The evaluation, in which the International Computer Security Association surveyed major NOS vendors about product capabilities, also finds Novell's other versions — NetWare 4.0, 3.11 and 2.2 — come in a close second to NetWare System Fault Tolerance (SFT) Level III Version 3.11, followed by Microsoft Corp.'s LAN Manager 2.2 and IBM's OS/2 LAN Server 3.0.

Banyan Systems, Inc.'s VINES 5.50 and VINES for SCO Unix 1.0 offers the least number of fault-tolerant features at the NOS level, although the underlying operating system, SCO Unix, offers a high degree of fault tolerance.

Unlike earthquakes, tornadoes and hurricanes, which take place with a great deal of fanfare, a security breach is an insidious disaster that can befall your enterprise network often without you ever being aware of it. Therefore, any truly complete set of local-area network security policies must include procedures for dealing with disaster recovery. And those procedures must take into account the fault-tolerant capabilities of your LAN operating system. Otherwise, you're taking a big gamble.

In the latest Network Security Test Series article, the International Computer Security Association probes major NOS products for their ability to provide disk mirroring, disk duplexing, transaction tracking and autoreconnect, as well as duplication of so-called File Allocation Table (FAT) files, file replication and the ability to cope with surface defects on a server's hard disks. All features are ranked to be equally important.

Disk mirroring

One vital fault-tolerant capability for network managers to have in a NOS — if they are keeping data on distributed LANs across an enterprise — is disk mirroring.

What happens to data if a hard

disk fails could be disastrous.

Disk mirroring is the duplication of data on two drives within one server. With most stand-alone computers, net managers are left hoping that the end user has made a recent backup. With NOSes that include disk mirroring, the controller will write to one drive and then copy the changes to the other drive so the two always match. Full disk mirroring means that if one of the paired drives fails, the other is automatically used, with no data loss or interruption of operation.

Neither VINES 5.50 nor VINES for SCO Unix 1.0 include disk mirroring. VINES for SCO Unix 1.0 delegates responsibility for disk mirroring to the underlying SCO

it to do so, the NOS sends an alarm to the network manager. When mirrored disks come up, they are checked to make sure they are consistent with one another. If not, the NOS schedules a sector-by-sector comparison between them, comparing all allocated space, and sends an alarm to indicate the problem to the network manager.

Partition mirroring is more flexible than disk mirroring because the disks involved in the mirrored pair do not have to be the same size. For instance, a 100M-byte partition on a 1G-byte disk can be mirrored by a 100M-byte partition on a 120M-byte disk. Full mirroring is supported. An advantage to partition mirror-

Fault-tolerant features of major NOSes

Vendor	Product	Disk mirroring	Disk duplexing	Transaction tracking	Autoreconnect	FAT duplication	Coping with surface defects	File replication
Banyan Systems, Inc. (508) 898-1000	VINES 5.50				✓		✓	
	VINES for SCO Unix 1.0				✓			
IBM (800) 426-2968	OS/2 LAN Server 3.0	✓	✓		✓	(1)	✓	✓
Microsoft Corp. (206) 882-8080	LAN Manager 2.2	✓	✓		✓	(1)	✓	✓
Novell, Inc. (800) 453-1267	NetWare 4.0	✓	✓	✓	✓	✓	✓	✓
	NetWare SFT III 3.11	✓	✓	✓	✓	✓	✓	✓
	NetWare 3.11	✓	✓	✓		✓	✓	✓
	NetWare 2.2 dedicated mode	✓	✓	✓		✓	✓	✓
	NetWare 2.2 nondedicated mode					✓	✓	✓
(1) Use OS/2's High Performance File System, instead of FAT FAT = File Allocation Table SOURCE: INTERNATIONAL COMPUTER SECURITY ASSOCIATION, WASHINGTON, D.C.								

Unix version running on client workstations.

OS/2 LAN Server 3.0 and LAN Manager 2.2 both offer a form of disk mirroring called partition mirroring. In other words, it permits the net manager to set up identical disk partitions on different drives in a server. Files are written to both devices, but disk reads can come from either disk partition.

Once mirroring has been set up, it functions transparently to the user. Since the NOS keeps statistics on I/O failures, disk reads are taken from the least busy disk, which translates into a performance gain. If a disk accumulates too many failures, the NOS redirects disk read requests to the alternate drive, although write operations continue.

With OS/2 LAN Server, if the network manager has configured

ing is that the network manager doesn't have to mirror everything, but instead can just back up programs once.

NetWare 2.2 running in non-dedicated server mode has no disk mirroring. In dedicated mode, however, NetWare mirrors volumes that are on separate physical drives but still on the same server. NetWare 3.11 and 4.0 perform similarly, but they also will duplicate whole physical volumes to another hard disk. The server verifies writes to both disks. NetWare SFT III V.3.11 performs disk mirroring, but the mirroring is done across two separate servers, an expensive proposition. Granted, it gives the network manager greater fault tolerance, but at a greater price

NetWare System Fault Tolerance III sets the standard for others to follow.

— as much as \$30,000 for the second server.

Disk duplexing

For an enterprise running mission-critical applications on an internetworked LAN, loss of data could be devastating. That's why disk duplexing can be important.

The drive is not the only component of a storage system that can fail. Therefore, disk duplexing — using such things as duplicate controllers, cables and power supplies — should be supported by NOSes. With disk duplexing, if a component fails, the redundant component can continue running without interruption to the network.

VINES 5.50 and VINES for SCO Unix 1.0 do not perform disk duplexing, although — as with disk mirroring — VINES for SCO Unix 1.0 delegates this responsibility to the underlying Unix operating system running on the client.

OS/2 LAN Server 3.0 and LAN Manager 2.2 both support disk duplexing through partition duplexing. The network administrator queues I/O operations to two different controllers, not only two different disks.

In nondedicated mode, NetWare 2.2 doesn't have disk duplexing. However, in dedicated mode, it does support disk duplexing by splitting volumes of data and using different channels to write those volumes to disk drives. This is a benefit over mirroring because it allows for a redundant controller and provides the ability to do split seeks, in which the server CPU receives data from whichever drive can respond faster, reading from that drive.

This has advantages. For example, with two drives, one will always be closer to the information the user seeks, so one drive will always be able to perform the

reads faster, making people more productive.

NetWare 3.11, 4.0 and SFT III V.3.11 work similarly. In addition, SFT III allows duplexing within one or both of the SFT III servers and then mirrors across them. This results in four copies of the information on the NetWare partition and essentially gives network managers a bullet-proof LAN — provided their mirrored servers are not sitting side by side in the same room.

Transaction tracking

Another fault-tolerant feature that NOSes should support is transaction tracking. If a user is entering a record in a database when some component on the network — the workstation, the cable or the server — fails, a partial write to the database may mean devastating damage to the database.

With transaction tracking, a predefined sequence of database changes can be defined as a transaction and the updates to the database can be denied by the NOS until the transaction is complete.

OS/2 LAN Server 3.0, LAN Manager 2.2 and NetWare 2.2 in nondedicated mode do not support transaction tracking. With all other versions of NetWare, however, this feature is available both implicitly, where the user flags files manually, or explicitly, where the software decides upon the flagging.

Microsoft's SQL Server, however, provides transaction tracking through a transaction log, using standard SQL commands to set up the log and corresponding database. The log can be used to recover a database that has crashed due to a hardware failure or for monitoring activity on a table. And Microsoft plans to have

(continued on page 50)

By DAVID STANG

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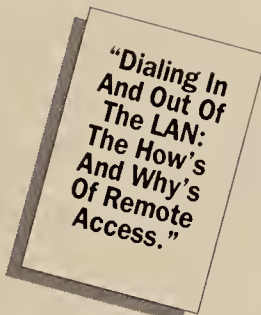
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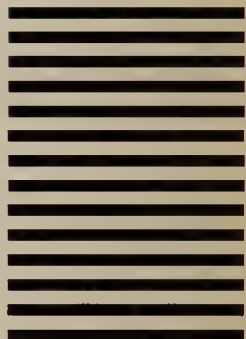
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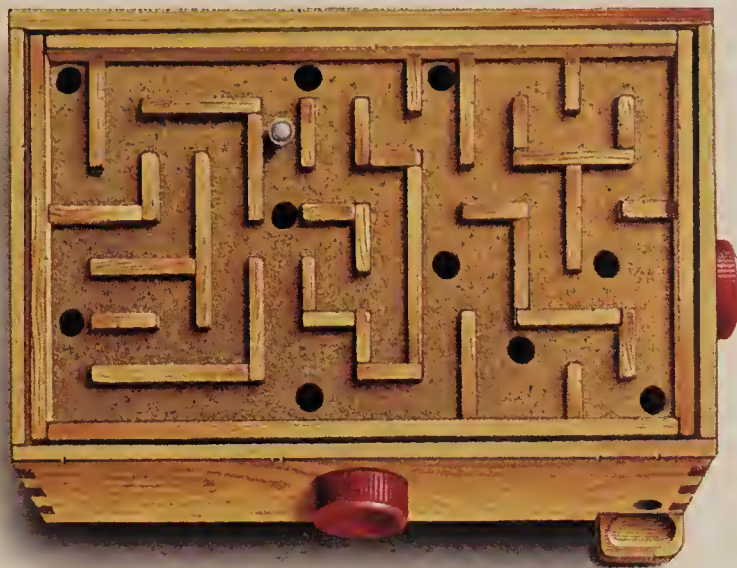
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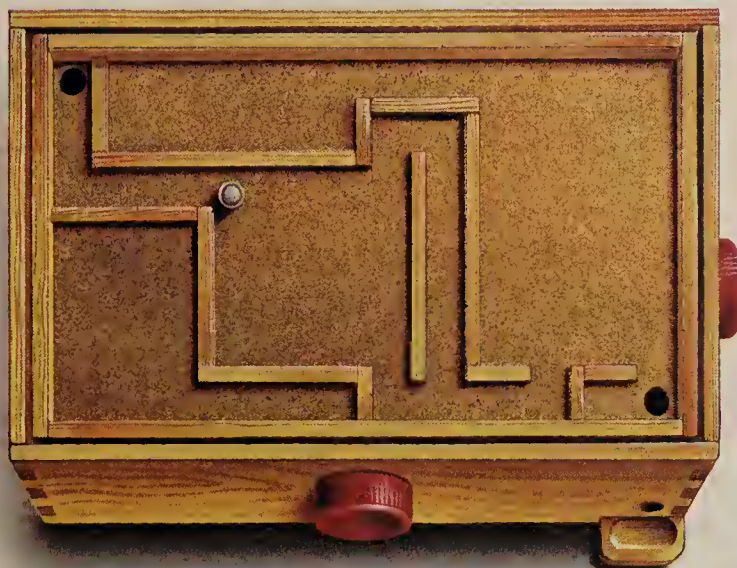
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(continued from page 48)

Windows NT provide a journaled file system for keeping records of previous versions of data in order to provide roll-back recovery if disaster strikes.

VINES 5.50 does not offer transaction tracking, and as with disk mirroring and disk duplexing, VINES for SCO Unix 1.0 supports the feature only if the client operating system does. VINES for SCO Unix 1.0 will support the server data base's ability to perform preimaging — making a temporary copy — but the network manager has to spend extra money to buy a data base program that will do that.

Autoreconnect

An important NOS capability relating to fault tolerance is autoreconnect, which enables the network to automatically reestablish a connection to a workstation, after temporary loss of power at the server.

VINES 5.50 and VINES for SCO Unix 1.0 support autoreconnect. With VINES for SCO Unix 1.0, session records are maintained by VINES Services. This enables connections to be automatically — as far as the user is concerned — reestablished.

An OS/2 LAN Server 3.0 utili-

ty, called LAN Requester, caches in client workstation memory all information necessary to reestablish a connection after the server is interrupted. Open files, locks and all connections are automatically reestablished.

LAN Manager 2.2 has had a long history with autoreconnect; LAN Manager 1.0 was the first NOS to implement it. Version 2.1 introduced a feature whereby connections are remembered and reestablished across logon sessions. That feature is still available in Version 2.2.

Of the Novell products surveyed, only NetWare 4.0 offers autoreconnect. If the connection between workstation and server is broken, autoreconnect tries to reestablish the connection before the server clears the station. With NetWare SFT III V.3.11, if one of the SFT III servers fails, its partner is available to continue servicing clients on the network.

A new shell allows clients to reroute to the new server. This ability, while expensive, is actually better than autoreconnect, because it is transparent to the end user.

FAT duplication

FAT is one of the most sensitive files on the server's hard

disk; it contains essentially a list of locations on the disk where each piece of information contained in a file is kept. If you lose FAT, you lose your means of finding files.

A server's hard disk contains many sensitive files, but none that is as irreplaceable as FAT. And, unfortunately, FAT is not usually backed up. So it's desirable that the NOS maintain a second copy of it. In a busy network, FAT is never the same from second to second.

Therefore, FAT duplication was an important feature that the International Computer Security Association examined when it evaluated NOSes. If either copy of the FAT becomes damaged, the NOS should be able to use an alternate copy, mark the damaged sectors of the original as bad and build a new second copy elsewhere, working with the good FAT file.

All versions of NetWare perform FAT duplication, making Novell the only vendor that supports it. With NetWare, duplicate copies of FAT are stored in two locations on the hard disk. If either becomes corrupted, the other copy is temporarily used. Then, the corrupted FAT is repaired by copying the good FAT to a new lo-

cation.

The NOS marks defective blocks on the hard disk as unusable and rebuilds new blocks elsewhere. This entire process happens transparently to the network manager and end users.

Neither VINES 5.50 nor VINES for SCO Unix 1.0 perform FAT duplication. As with many other fault-tolerant features, VINES for SCO Unix can rely on any file system fault tolerance provided by the client operating system.

OS/2 LAN Server 3.0 and LAN Manager 2.2 do not use a FAT file because they are not DOS-based. OS/2 uses a file system called the High Performance File System (HPFS), which both Microsoft

and IBM claim is more robust than DOS' FAT structure. With HPFS, many structures have double pointers and are signature stamped. Both NOSes take an entirely different approach, but one that is nonetheless adequate.

Coping with surface defects

In today's enterprise networks, a server's hard disks are typically in use 24 hours a day, seven days a week. A NOS that can cope with surface defects on the hard disk can provide net managers with a way to tell when a disk is dying a slow death.

This ability to cope with surface defects was considered an important fault-tolerant feature

The International Computer Security Association conducted this research as part of the Network Security Test Series. The association's mission is to help personal computer and local-area network users improve the security of their information systems, reduce the threat of computer viruses and ensure the integrity of their information resources.

The findings in this article were based on a report pub-

lished by the International Computer Security Association. It contains the results published in this article, as well as additional findings and background information about the products.

For more information, please call the association's Virus Research Center at (202) 364-8252 or fax the center at (202) 364-1320. The group can also be reached through its bulletin board system at (202) 364-1304.

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to cover in the survey. It's important for network managers to know how a particular NOS deals with disk surface defects.

VINES 5.50 copes with surface defects by providing configurable read-after-write verification to remove bad sectors. VINES for SCO Unix 1.0 doesn't have this feature. As with disk mirroring, disk duplexing, transaction tracking and FAT duplication, VINES for SCO Unix 1.0 relies on the client operating system for support for this capability.

With OS/2 LAN Server 3.0, HPFS manages bad disk sectors and reroutes away from them. It maintains a pool of 100 hot fix sectors, those which are reserved for use when another sector goes bad.

When a read or write returns an error code, the NOS will retry writing the data several times, then write the data in one of the hot fix sectors. When a hot fix is done, the network administrator either receives a printed message or an alert.

Also, the NOS keeps a log of error messages. In a file available to the network manager, the NOS stores a counter that keeps track of the number of hot fixes. The CHKDSK utility, which detects disk flaws and corrupted directo-

ries, runs automatically at boot time or when the power fails.

Microsoft LAN Manager 2.2's HPFS also has a feature called hot fixing. If a bad sector is detected on a write operation, HPFS will mark it bad and write the data to an unused sector. After about 20 hot fixes are made, the administrator is alerted to this condition and told to run CHKDSK on the partition. CHKDSK will remap the hot fixed sectors and the corresponding file system structures and allocate more sectors to the hot fix pool.

If you have implemented Disk Fault Tolerance (FT) when installing your server, each hot fix is logged as an error in the FT log file. The net manager can run the FTADMIN utility to view the FT log and see which sectors were hot fixed and how many were fixed. (The administrator can either run this at the server or remotely.)

All versions of NetWare read back what has been written, to verify the accuracy of the write, much like the verify feature of MS-DOS. If NetWare's read-after-write verification determines that the surface is turning bad in some spot, information from that spot will be written to a hot fix redirection area. The faulty areas that

are labeled bad are listed in a bad block table.

File replication

The International Computer Security Association's survey also investigated NOSes' various support for file replication. With file replication, a network administrator can specify that certain files on servers are to be duplicated at specified intervals on other servers that are part of the inter-network.

This feature can be useful when many users, on multiple servers, need to have read access to some file, while other users on the source server are charged with updating it.

VINES 5.50 and VINES for SCO Unix 1.0 do not offer this capability, but OS/2 LAN Server 3.0 does. LAN Server 3.0's replicator service allows a server or client to replicate files on a per-directory basis, with an option for replicating all subdirectories under the specific directory.

LAN Manager 2.2 supports both file and directory replication. The ability to replicate specific files is better than replicating entire directories because the directory might be full of data that is not mission-critical. Replicating such data would be a waste

of time. Files and directories can be replicated to servers and OS/2 workstations.

Replication is designed primarily for the replication of user account information and login scripts.

With LAN Manager 2.2, servers unavailable at the time of replication notify the primary domain controller when back online and replication is then automatically restarted for the previously downed server. User intervention is not required.

Backup domain controllers can also handle replication should the primary domain controller be out of service, and, again, user intervention is not required.

All versions of NetWare support file replication.

The final lineup

If you are shopping for a NOS, be sure to look at the fault-tolerant features available. Most network managers don't like to think about it, but they will need these capabilities one day.

Of the major NOSes in this survey, Novell's NetWare SFT III is clearly the strongest, followed by other Novell products. NetWare SFT III V.3.11 not only supports all the features the International

Computer Security Association considered critical, but, in some instances, it improves on those features.

For example, NetWare SFT doesn't offer autoreconnect as the survey defined it, but instead offers a feature that allows a secondary server to continue serving users transparently should one fail.

While NetWare 4.0 also offers all these features, it didn't improve on them. NetWare 3.11 and 2.2 in dedicated mode make available six of the seven features, missing out only on autoreconnect.

The two OS/2-based NOSes — LAN Manager 2.2 and OS/2 LAN Server 3.0 — offer five of the seven features surveyed. One that they lack is transaction tracking, and for the other — FAT duplication — both offer an alternative, HPFS, an improvement on DOS' file system. VINES 5.50 just offers two of the seven, while VINES for SCO Unix 1.0 makes available only one, but leaves the bulk of fault tolerance to the operating system. ■

Stang is director of research with the International Computer Security Association in Washington, D.C.

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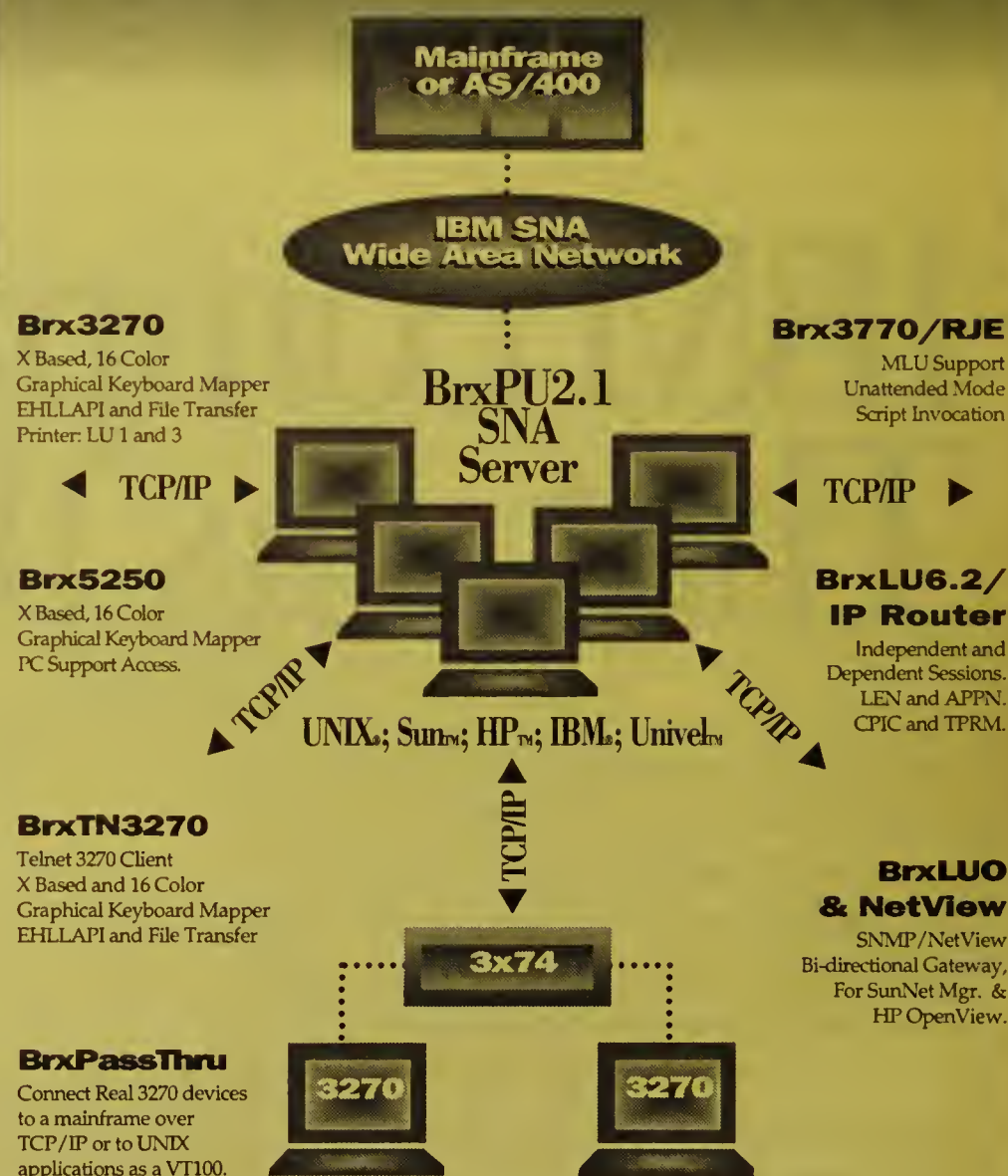
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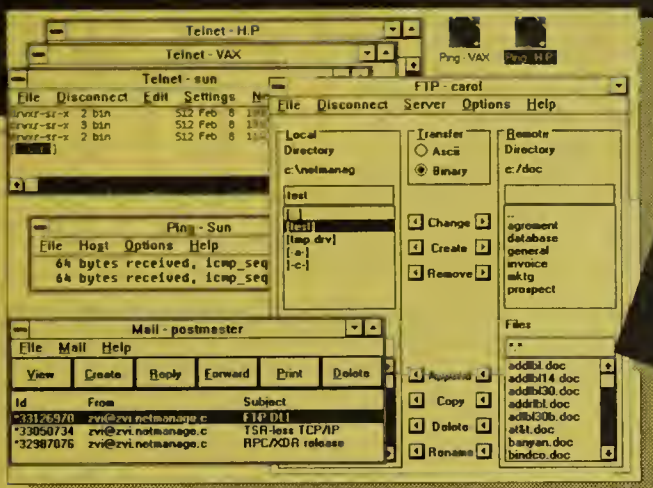
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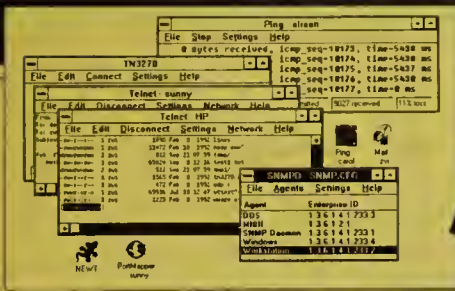
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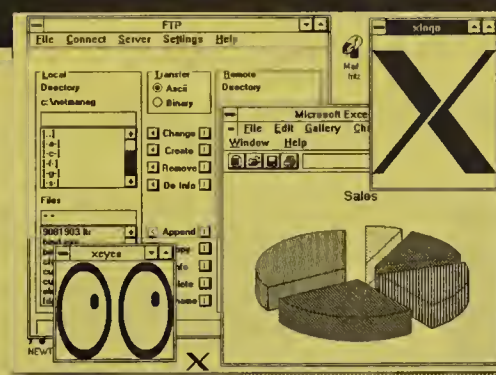
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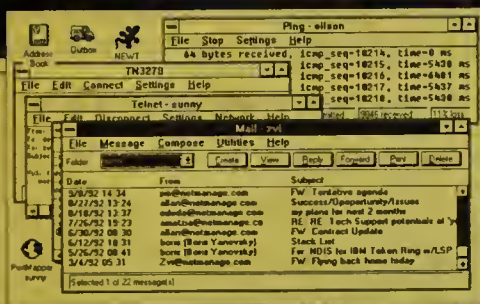
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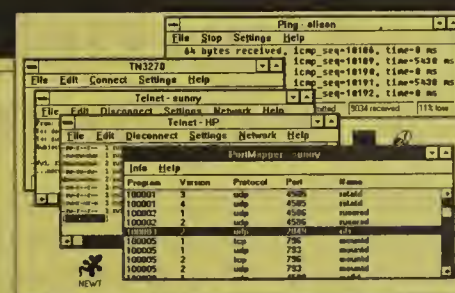
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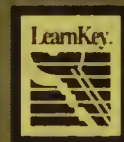
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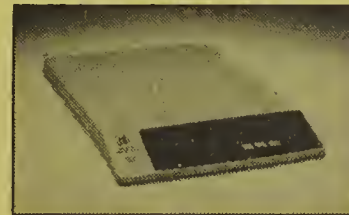
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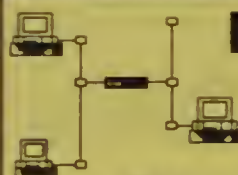
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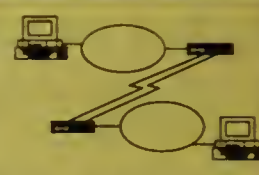
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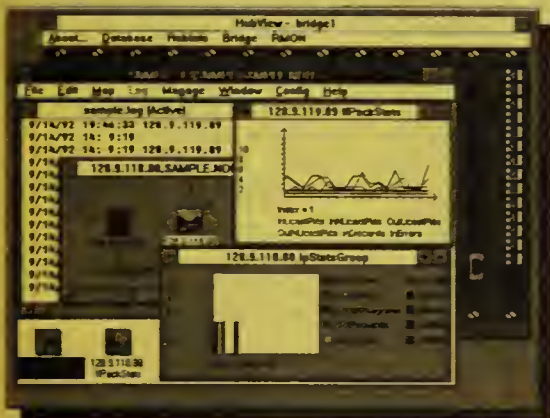
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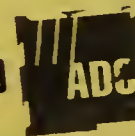
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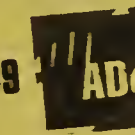
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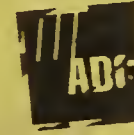


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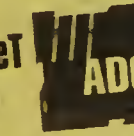
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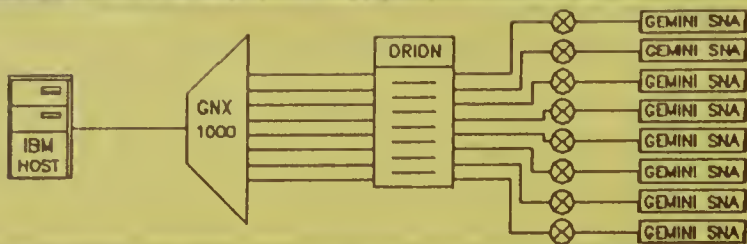


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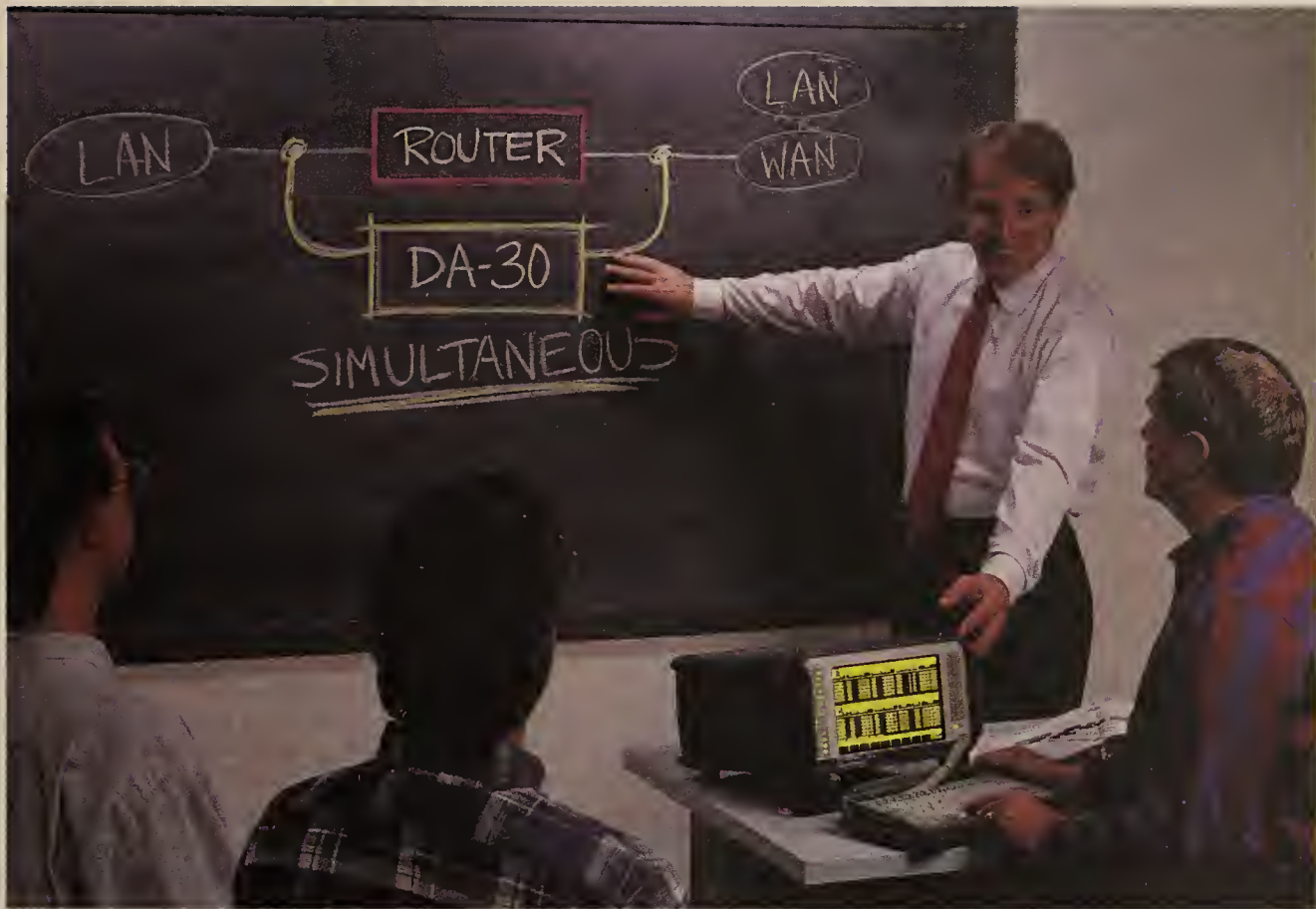
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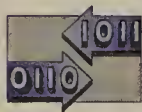
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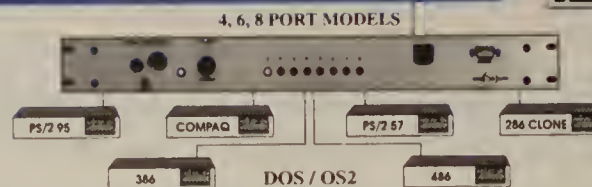
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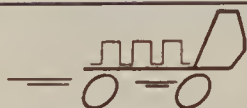
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AT&T eases up on Fresh Look

continued from page 1

July 29 during which existing Tariff 12 customers with 800 service can break their contracts without penalty to take advantage of portability, which begins May 1. The rate hikes proposed by AT&T would hit users that are still trans-

Tariff 12 customers that bail out, the carrier hopes they will pass on Fresh Look by signing a waiver. AT&T did not say much about the waiver process and insisted it will not give special deals to customers signing waivers.

But Daniel Briere, president of TeleChoice, Inc., a Montclair, N.J., consultancy, said no customer should sign a waiver without getting something in return. Briere also said that if the AT&T Fresh Look tariff is approved by the FCC, users that decide to terminate their deals should make their new service provider pick up the extra charges.

The Fresh Look tariff represents a compromise worked out with the Custom Network Services Group, according to the group's chairman, Hank Levine, an attorney with Washington, D.C. law firm Levine, Lagapa & Bloch. "This is far more acceptable than the 50% to 70% AT&T earlier proposed," Levine said.

He said about a third of the 180 Tariff 12 users are contemplating switching traffic from AT&T during the Fresh Look period, but probably not more than 10% will ultimately move.

According to Steve Martin, a partner in consulting firm Deloitte & Touche, about 15 Tariff 12 customers have asked the firm for help in analyzing competing

offers from long-haul carriers.

Any Tariff 12 customer considering a move from AT&T will need to have a request for proposal out on the street within a month in order to complete negotiations before the window of opportunity closes, Martin said.

The FCC's Fresh Look window from May 1 to July 29 does not apply to AT&T's more recent "contract-carriage" customers whose deals began after April 16, 1992. But it does apply to Tariff 16 government contracts, such as the federal government's Federal Telecommunications System 2000 network, as well as contracts for AT&T's Software-Defined Network bundled with 800.

AT&T said it does not plan to file a Fresh Look price plan for Tariff 16. But three weeks ago, the carrier filed its Fresh Look termination plan for SDN with 800 service under Tariff 1, which would up rates by about 20% on a month-to-month basis after July 29 for customers breaking their multiyear contracts.

MCI Communications Corp. and Sprint Corp. have protested the SDN Fresh Look filing, and both will try to block the Tariff 12 Fresh Look plan, as well.

"They are subverting the FCC's intentions on Fresh Look," said Gerry Euston, vice president of 800 marketing at Sprint, who said customers voiding contracts should not have to face any rate hikes. "AT&T is using this as a barrier to users and another hurdle [for] Sprint and MCI to overcome." □

Who is your RespOrg?

BASKING RIDGE, N.J. — The Big Three carriers are laying out plans for services designed to help users split calls to an 800 number among multiple carriers once 800 portability arrives May 1.

AT&T, MCI Communications Corp. and Sprint Corp. hope the services will help persuade users to choose them as their 800 Responsible Organization (RespOrg). RespOrgs can reserve, activate and deactivate 800 numbers on behalf of users, as well as create and update records, and support maintenance activities such as tracking and clearing troubles.

AT&T, MCI and Sprint each claim they are best suited to serve as RespOrgs, although some admit the jury is still out. "It's really impossible to say which one of the carriers is best suited for the job since none of us has any experience in this area," said Dick Goulet, Sprint's director of business product marketing for 800 service. "We'll have to wait and see."

Preparation for 800 portability began last year when MCI announced its MCI 800 MultiManager service. AT&T anted up last week by detailing its 800 Service Management offering.

Goulet said Sprint will announce Sprint Secure Diversity in the near future. In a break

from AT&T and MCI, Sprint will provide the service at no charge, he said.

With both AT&T's 800 Service Management and MCI's 800 MultiManager, the carriers can use dedicated links to a central database in order to create and update vital customer records and manage routing instructions that change as users move from carrier to carrier to handle 800 calls.

"We invented 800 service over 25 years ago, have led the industry in developing technology that enhances the service and have provided [800] network management to users for several years," said Shawn Gilmore, marketing vice president of AT&T's 800 service.

MCI counters that, saying, "We have the most experience in the competitive marketplace as we introduced competition in long distance and 800," said Dawn Clark, director of 800 marketing for national accounts at MCI.

AT&T will offer the service free to firms that only use 800 service under customer-specific contracts, but it will charge for the service if a customer uses multiple 800 service providers. The same holds true for MCI, which has not yet set pricing for 800 MultiManager.

— Bob Wallace

AT&T's "Fresh Look" pricing menu

Plan A (month-to-month)

User cancels Tariff 12 contract, voiding previous rates. \$25,000 service charge per month takes effect, with negotiated rates averaging about 20% more than the customer would pay under current Tariff 12 Virtual Telecommunications Network Service (VTNS) rates.

Plan B (available for 3-month period following Fresh Look)

Discounts and regulations specified in the customer's Tariff 12 contract still apply, but there is a surcharge of:

5% in the first month
10% in the second month
15% in the third month

The basic charge will not be reduced below \$25,000. AT&T's Fresh Look filing made under Tariff 12 includes provisions for both voiding current Tariff 12 VTNS contracts and affirming them by having the customer sign a Fresh Look waiver. If a customer cancels a contract, either Plan A or Plan B will take effect.

SOURCE: AT&T, BASKING RIDGE, N.J.
GRAPHIC BY TERRI MITCHELL

sitioning traffic to a new carrier after the Fresh Look period.

In addition to detailing its Fresh Look plans, AT&T announced plans for 800 Service Management last week (see "Who is your RespOrg," this page).

While AT&T has outlined the new conditions it wants to set for

Federal Reserve disaster-proofs net

continued from page 1

saster recovery strategy is part of the financial institution's FedNet project, a five-year plan to rearchitect its funds transfer net and consolidate 12 data centers into three. FedNet is to be completed in 1995 ("Federal Reserve upgrading funds transfer system," *NW*, Oct. 8, 1990).

"We'll be able to do rerouting in the backbone, like we do today, but we'll also have backups in place to restore [comput-

ing] capacity as soon as we have a problem," said David Ritter, an assistant vice president at the Federal Reserve Bank of Chicago. For both networking and data processing, the Fed is looking to provide full redundancy of operations and better than 99.99% network availability.

Currently, the Fed uses a packet-switched network, called FRCS 80, to link its 12 regional banks to one another, to other depository institutions and to the Fed's only backup data center here.

FRCS 80 is based on 56K bit/sec leased lines and Northern Telecom, Inc. DPN-100

packet switches, which can route around failed links and nodes. A 56K bit/sec very small aperture terminal satellite net provides backup for the leased lines and a cold site in Detroit serves as a secondary net control center in case the primary management facility in Chicago goes down.

That setup enables the Fed to restore the operations of two regional banks simultaneously at its backup data center here.

But two outages is too close for comfort, so backup capabilities and service to customer banks will be enhanced with Fed-

Net, which will provide increased network and data processing capacity and higher speed links. Key to the FedNet project is the consolidation of the electronic funds and data processing operations of 12 regional banks into three data centers. The data centers will be located in East Ruther-

Start-up readies line of modular superservers

By Joanne Cummings
Senior Writer

CONCORD, Mass. — Modular Computing Technologies, Inc., a start-up based here, this summer is expected to unveil new superservers based on Intel Corp.'s Pentium chip.

"It will be a family of superservers that are scalable, from something small, on the level of a Compaq [Computer Corp. device], all the way up to a high-end, million-dollar superserver," said Barry Goldstein, president and chief executive officer of the firm and a former Digital Equipment Corp. executive.

Modular, founded in December 1992, is rumored to have received financial backing from former DEC founder Ken Olsen. Goldstein declined to comment on that although he did say Olsen offers advice from time to time.

Modular's high-end units will be able to support thousands of users and as much as 30T bytes of on-line storage, Goldstein said. The company is focusing on offering users easily maintained servers in a scalable package.

The firm plans to bring the functionality associated with minicomputers and mainframes, such as fault tolerance and security, to the server environment. "All of our systems will be fault-tolerant," he said. "And we're not just talking about mirroring two disks." He declined to be more specific.

In addition, all the equipment is designed for easy access. For example, users need only open the front doors of the enclosure to access any component.

Goldstein said the 35-person firm will be the price/performance leader in the superserver arena because it is able to leverage experience in mainframes and minicomputers, as well as desktop systems.

"In the server industry, what you see is the traditional mini and mainframe people working down, and the traditional PC vendors working up," he said. "Our team brings years of experience on both ends." For example, prior to his stint at DEC, Goldstein worked at IBM on products including MVS, DB2 and IBM Personal Computer XT workstations.

In addition to the servers, Goldstein said the firm will manufacture 486 DX-type, Pentium-ready, client computers that weigh just three pounds and are the size of a small book.

He said the company will also likely develop software and internetworking products, as well as servers based on Reduced Instruction Set Computing chips, but declined to provide more details. **Z**

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ford, N.J., Richmond, Va., and Dallas, and will be linked via a T-3 backbone network.

Currently, the processing of funds payment and "region-unique" applications, such as payroll and administrative systems, is performed at all 12 regional banks. With FedNet, funds payment applications will be handled from the East Rutherford site and region-unique applications will be processed in Richmond and Dallas.

Each regional bank will feed data into the data centers over T-1 and fractional T-1 lines rather than of the 56K bit/sec lines used in today's FRCS 80 network.

Should the East Rutherford facility go down, Richmond would serve as a hot site for that center. Dallas will serve as a stand-by hot site for funds transfer processing if problems occur in Richmond.

That means two data centers can back up the funds transfer processing operations of the 12 regional banks simultaneously, instead of one facility backing up only two regional banks at the same time.

For region-unique applications, Richmond and Dallas will back up each other.

The Fed is also engineering more circuit diversity into FedNet so lost circuits will not disrupt information flow. Communications equipment in regional banks and data centers will use separate lines to access similar services from different local and long-haul carriers, Ritter said.

"There's no point at which those [circuits] cross," he said. But just in case, the Fed will use service-protection features from local exchange carriers where they are available and use alternate access providers in some areas, Ritter added.

For network availability and security, the Fed recently acquired matrix switches from Data Switch Corp. and data encryp-

tion devices for its T-1, fractional T-1 and T-3 links from Cylink Corp. The matrix switches connect workstations, servers and front-end processors, as well as local-area network hubs, bridges and routers, using a variety of configurations to supply connection redundancy and mainframe session restoral.

The Fed will also upgrade its VSAT net to T-1 speeds so critical office locations will be able to do an end-to-end bypass of terrestrial circuits, Ritter said. Fed sites that cannot cost-justify a VSAT dish will use wireless modems to bypass the local

loop for gaining access to long-distance carriers.

"I can go up to a 10-mile radius from the Fed location to connect to the long-distance carrier, thereby eliminating what is the biggest problem in the carrier environment — the last mile of service to the premises," Ritter said.

Network management will also undergo a transition.

Today, during the time it takes to relocate people and activate the backup control center in Detroit, nobody is watching the network. To remedy that, the Fed will

staff a secondary network control center in Richmond around the clock. The network management duties will be split between Chicago and Richmond staffs, both of which will use Ascom Timeplex, Inc.'s Time/View 2000 net management system. If one center goes down, the other can immediately back it up.

"[FedNet] really reflects a next generation not only of our processing capabilities, but also of our disaster recovery capabilities," said Thomas Gagnon, chairman of the Fed's steering committee on disaster recovery. ■

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Companies race to server market

continued from page 1

survival," said Carl Amdahl, founder, chairman and chief technology officer at NetFRAME Systems, Inc., a Milpitas, Calif., Intel-based superserver vendor.

Intel camp

Virgil Hornstein, director of North America System Product Marketing for Compaq Computer Corp. in Houston, said the company has efforts underway to make it more competitive in the higher end of the server market. The company will leverage a key attribute of its SystemPro servers — the ability to swap processor cards in and out — to let users transform existing servers into multiprocessor Pentium systems.

Compaq will also enhance the SystemPros with new systems management features, higher I/O, more storage capacity and built-in uninterruptible power supplies.

Compaq's challenge is to do all of this and keep the products

selling for less than \$20,000 to start. "We're driving towards making this affordable," Hornstein said.

Hewlett-Packard Co. plans to introduce in May and ship in June new Intel-based servers that will move beyond the company's existing line of Vectra Servers, said Jim McDonnell, marketing manager for HP's California Personal Computer Division.

While McDonnell declined to discuss specifics of the new products, he said the new server line will support Pentium and include HP's first multiprocessor server, as well as new systems management capabilities. "Our strategy is summarized in one phrase: easy-to-manage servers," he said. "MIS people buying these servers require that."

The Intel-based servers will complement the company's Precision Architecture-Reduced Instruction Set Computing (RISC)-based servers and will be managed through an HP OpenView-based application, dubbed NetServer Assistant. Other features will include fast Small Com-

puter System Interfaces, I/O, disk arrays, error checking, and correction memory and fault tolerance capabilities.

NetFRAME's strategy focuses on supporting a new class of ap-

While the PC-based server vendors are charging hard, big iron vendors may have an edge in the evolving server market.



plications that go beyond what a traditional file server can support and are too costly to run on hosts.

"All the Intel-based vendors from the PC side of the fence have made their money in the file server sector, but the bottom line is that there is too much competition there, so they are eyeing the database area and other functional server classes," said Brad Day, principal analyst for client/server systems at Dataquest, Inc., a market research firm in Framingham, Mass.

NetFRAME recently introduced a line of servers that can be configured with a cluster of processors providing specialized processing for each application. While NetFRAME's new boxes are based on Intel processors, Amdahl said the company may provide support for DEC's Alpha or other processors in order to support applications designed for those systems.

Systems vendors

While the PC-based server vendors are charging hard, big iron vendors may have an edge in the evolving server market, analysts said.

"The systems vendors are much better positioned than the PC vendors in the client/server application market," said Tom Kurchavy, president of Summit Strategies, a market research firm in Boston. "Migrating to client/server systems is not intuitive — it takes a lot of work to design them. The systems vendors that have the consulting and systems integration expertise needed to integrate client/server and legacy systems."

Both DEC and IBM are pitching a "one size doesn't fit all" server strategy and are offering users a choice of server platforms and operating systems.

DEC is offering servers based on Intel processors, VAX processors and its new RISC Alpha processors, arguably the most strategic of the three. According to

Rene Martinez, marketing manager for Alpha-based DEC 4000 servers, Alpha servers will range from uniprocessor to multiprocessor systems and run Open Software Foundation, Inc.'s OSFI Unix, VMS and Microsoft Corp.'s NT operating systems.

DEC's strategy is to support applications and operating systems that users demand, while providing the VMS-type management capabilities that users expect from DEC, he said.

Beyond Alpha, DEC is making a big push in the traditional PC-based server market, with systems including low-end MT servers, Pentium-upgradable ST servers and higher end application DEC servers, which are available in a multiprocessor configuration.

"We have a lot of experience to understand customer needs in the area [of supporting mission critical applications]," said Nancy Tanana, product marketing manager for PC products at DEC in Acton, Mass. "The PC companies coming upstream are only learning about these things."

IBM, like DEC, offers a broad line of servers that includes Intel-based servers and superservers, RISC-based mid-range servers, and even minicomputers and mainframes configured as servers.

IBM's efforts with Apple Computer, Inc. and Motorola, Inc. could result in new RISC-based servers that run the Taligent operating system, which can support applications designed to run

Both DEC and IBM are pitching a "one size doesn't fit all" server strategy and are offering users a choice of server platforms.



on any number of different operating systems, said Atul Kapoor, principal at Kaptronix, Inc., a Hawthorn, N.J., consultancy.

At the higher end of the server market, IBM is looking to port minicomputer and mainframe operating systems to lower priced hardware architectures, said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C., consulting firm. Running OS/400 or MVS on symmetrical multiprocessing, clustered or parallel processing RISC-based servers could be an attractive platform for users with enterprise applications, he said. ■

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Server, software vendors plot their Pentium plans

SANTA CLARA, Calif. — Intel Corp.'s announcement last week that its new Pentium processor is shipping created a stir in the network market as vendors extolled the possibilities that the processor presents.

Vendors such as Compaq Computer Corp., Digital Equipment Corp., Hewlett-Packard Co., IBM and NetFRAME Systems, Inc. said they will provide servers based on Pentium, although they agreed to delay detailed product announcements until May, when Intel will reveal Pentium pricing.

Intel officials have said Pentium runs as much as five times as fast as its 80486 processors and that Pentium-based computers will start in the \$5,000 to \$15,000 price range.

Brad Day, a principal analyst for client/server systems at market research firm Dataquest, Inc. in Framingham, Mass., said Pentium may increase the price of the servers but will allow these products to support databases and other high-end applications.

Carl Amdahl, chairman, chief technology officer and founder of NetFRAME, agreed that Pentium will help to support new client/server applications.

"I doubt the traditional file servers of the last few years

need Pentium — they are more I/O than processor-bound," he said. "But there is a move in the server industry to more of an application focus, and that's where the additional processing power of a Pentium chip is interesting."

Software vendors also got into the Pentium act. Gupta Corp. announced that it will optimize its SQLBase Server database system, plus its SQLWindows and Quest front-end tools, to support Pentium. Oracle Corp. announced that its Oracle 7 database and its development tools will be optimized for Pentium.

Anand Jagannathan, president of Reach Software Corp., a Sunnyvale, Calif., work flow software vendor, said the power of Pentium will be important for supporting emerging application software, such as work flow software. Users will be able to run work flow processes in a background mode, for example, while continuing to work on spreadsheets or other applications, he said.

In a prepared statement, Novell, Inc. President Ray Noorda said Pentium "will accelerate the growth of the networking industry. NetWare will benefit significantly from Pentium processor technology."

— Bob Brown

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